Background Material

for Energy Frontier Program at Argonne National Laboratory

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1. Introduction

The Energy Frontier B&R code at Argonne covers two areas of energy frontier research: collider physics at the Tevatron with the CDF Detector at Fermilab, and with the ATLAS Detector at the Large Hadron Collider. In both experiments, members of the Division played a critical role in design, construction, commissioning, maintenance and operation of the detectors as well as in physics analyses. Argonne has provided outstanding expertise in the design and construction of large calorimeter systems for these experiments and others. A good example is the tile calorimeter for ATLAS at the LHC, for which Argonne had the primary responsibility for developing the tooling for calorimeter module manufacturing, and for coordinating the construction contributions of the university groups in the U.S. Complementing the calorimeter design and construction efforts, Argonne has made major contributions to front-end and trigger electronics for both experiments and to the development of key core software for ATLAS.

The actual and requested funding for the Proton Accelerator B&R KA11 at Argonne for FY11 through FY15 is given in Table 1. This summary is taken from the budget tables submitted for this review. The funding in this table supports CDF, ATLAS, FTK, detailee assignment and the Early Career Award for "Enhancement of the Trigger Capability for New Physics at the Large Hadron Collider". This program also benefited from two postdoctoral members of the group (Paramonov and Feng) who are supported as Argonne Laboratory Named Fellows. Three or four of these highly competitive Fellowships are awarded annually for the whole laboratory, and all divisions compete for them on equal bases. The Fellows are funded by the laboratory directorate, and so these funds are not included in any of the tables in this document.

FY11 (actual)	FY12	FY13	FY14	FY15
$5,779K	$5,985K	$6,022K	$6,161K	$6,101K

Table 1: Funding for the Proton Accelerator B&R KA11 at Argonne

2. Collider Detector at Fermilab

2.1 Overview

Argonne HEP was one of the founding institutions in the Collider Detector at Fermilab (CDF) collaboration. Argonne's role in CDF included detector design and construction, major detector upgrades, contributions to commissioning, test beam studies, detector maintenance and operations, and physics analysis. Argonne led the original design and construction of the central electromagnetic calorimeter. Argonne had substantial involvement in upgrades before, and during, Run II. Our group has provided leadership in the physics groups (electroweak, QCD, and B physics) and in CDF operations. Our group has also contributed to important physics analyses, including b-hadron production and B-meson mixing, precision electroweak measurements, QCD studies, and searches using prompt photon production. This formerly major program is concluding in good order.

2.2 Accomplishments 2009-2012

Except for a shutdown late in FY09, CDF consistently logged data at a rate of slightly higher than 2 fb^{-1} per year. The run ended September 30, 2011, with a dataset corresponding to10 fb^{-1} collected, about half of which is from this period under review. Good operational efficiency was maintained, and the calibration and reconstruction efforts remained timely. Nodulman and Willis Sakumoto (Rochester) headed the operations and calibration efforts for calorimeters. All data were quickly calibrated and made available for full dataset analyses, the results of which include the intriguing Higgs results presented at winter conferences in 2012. The central electromagnetic response offline for W and Z decays is shown in Figure 1. Online response was uniform within 4%.

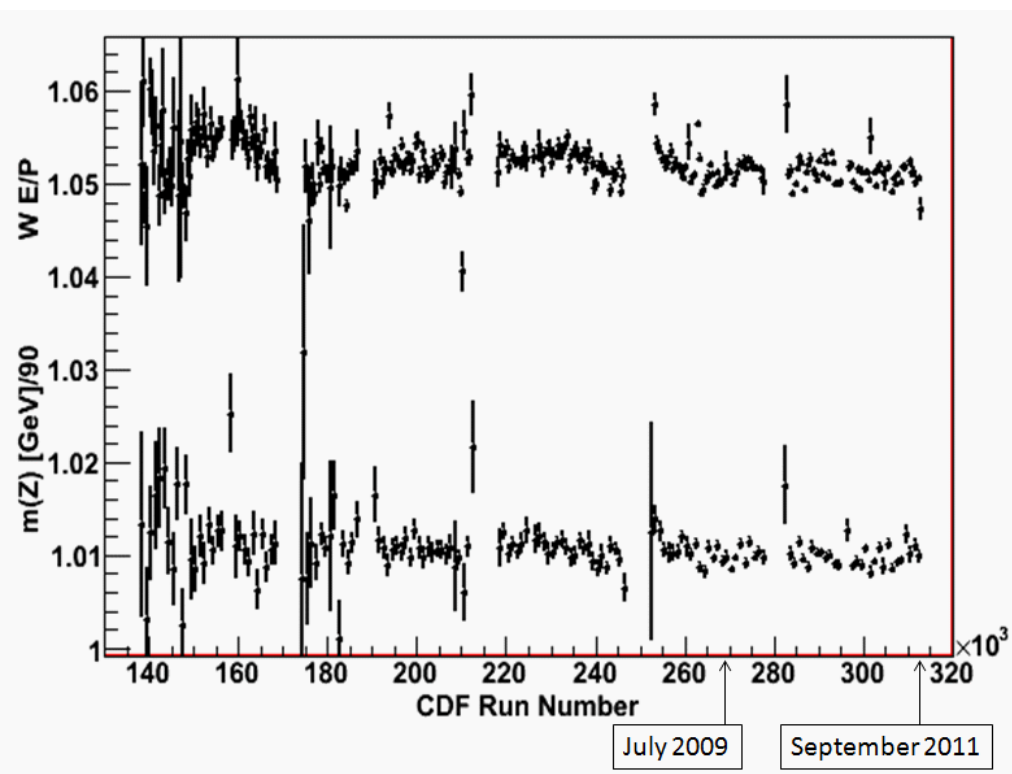

Figure 1: Profiles of central electron Z mass and W E/P versus run number.

During this period the collaboration was shrinking and efficiency increased as needed. Physics effort was directed toward a possible Higgs signal, and, as the LHC turned on, many physics topics became less competitive.

CDF submitted 152 papers to journals. All of the papers were read by the spokespersons reading group, chaired by Wicklund. Sixteen of these are topcite 50+. Fourteen papers came through the electroweak physics group, headed by Nodulman and Mark Lancaster (University College London). Electroweak publications included a limit on $W \rightarrow \pi\gamma$, studies of diboson production ($Z\gamma$, WW, WZ, ZZ), and detailed studies of Z production. A complete list of publications is available at http://www-cdf.fnal.gov/physics/preprints/index.html.

Of particular note is a letter on the precise W mass determination, 80387 ±19 MeV/c^2 (Phys. Rev. Lett. 108 (2012) 151803). An article on this measurement is under preparation. Nodulman contributed to several aspects of this analysis, continuing his long-standing interest in this subject. Among the contributions of note is the determination of the central electromagnetic calorimeter resolution constant term that deals with longitudinal leakage fluctuations explicitly and includes, among other things, the effect of any uncorrected non-uniformity in space and time. The physics implication of the new Tevatron W mass measurements is illustrated in Figure 2. The new CDF measurement is more accurate than the previous world average.

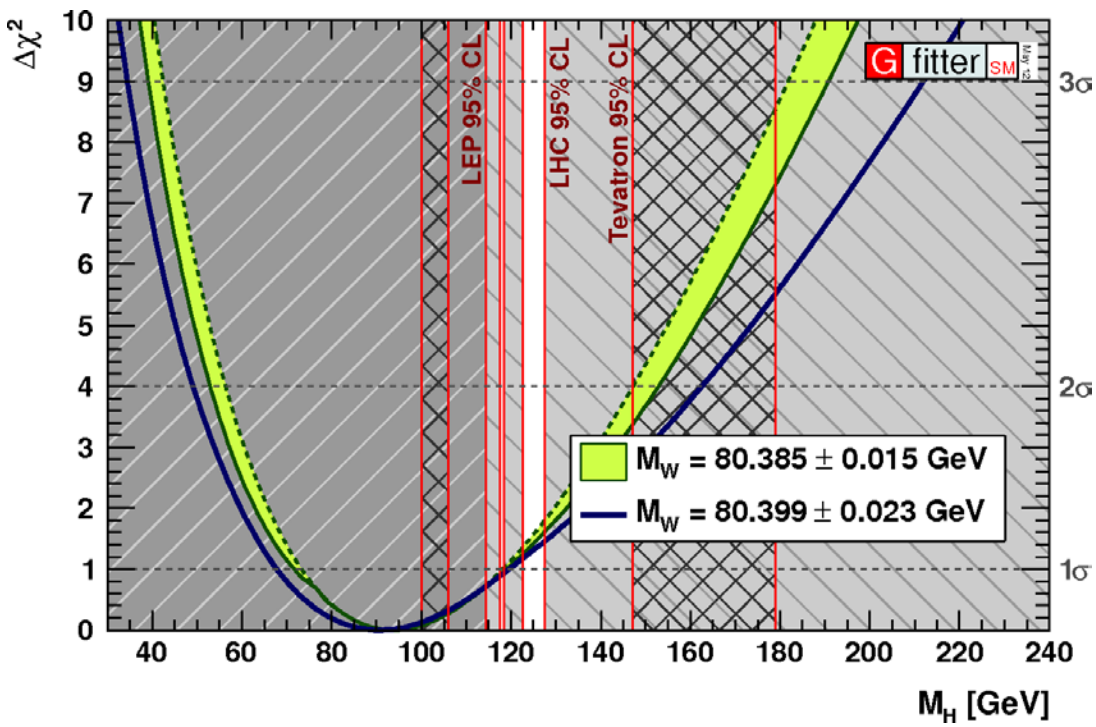

Figure 2: The Gfitter standard electroweak fit showing the effect of the recent improved W mass measurements. The Higgs mass constraint has tightened but the remaining window is as compatible as ever with electroweak measurements.

Wicklund served as internal reviewer for studies of $B \rightarrow J/\psi\ \phi\ K$ and $B_C \rightarrow J/\psi\ l\ \nu$. Nodulman served as internal reviewer for the top mass measurement using lepton p_T, and for the template method top width measurement. Blair served as internal reviewer for "Searching the Inclusive lepton + photon + MET + b-quark Signature for Radiative Top Quark Decay and Non-Standard Model Processes." Auerbach is continuing to serve as an internal reviewer for "Search for the Higgs Boson with the Diphoton Final State."

2.3 Plan for 2012-2015

The success of LHCb has implications on the direction of the CDF B physics program. Wicklund is serving on a "wise men" committee to identify and prioritize those analyses where CDF still has excellent opportunities to contribute.

As part of the consolidation of CDF physics in the LHC era, the electroweak group has merged with the QCD group to form the Standard Model group, headed by Nodulman, Mark Lancaster (University College London), and Christina Mesropian (Rockefeller University). Several interesting analyses are planned to be completed this year. These include a Z angular correlation analysis with the full dataset of both electrons and muons for an accurate Weinberg angle measurement, a ZZ cross section update, a search for exclusive W decays, diphoton production, production of heavy flavor with photons, and several studies using the energy scan data taken toward the end of the run (300 and 900 GeV to compare to the usual 1960 GeV). On a longer term, steps are being taken to make a full dataset W mass measurement, but no Argonne involvement is anticipated.

Wicklund anticipates some continuing involvement in B physics analysis while Nodulman anticipates reducing his involvement to consultation only by the end of this year. Other small involvements are expected to finish quickly.

2.4 CDF Notes

R. Blair, "Signature based Searches for new physics involving photons at the Tevatron," ICHEP 2010.

A. Paramonov, "Limitations on the predictions for p_T-balance in events with a Z-boson and jets," DIS 2010.

"Theory-driven limitations on p_T-balance in events with a Z-boson and jets," A. Paramonov, F. Canelli, H.J. Frisch, M. D'Onofrio, and S. Mrenna , CDF/PHYS/JET/CDFR/10026, 2010.

"Search for the Neutral Current Top Quark Decay $t \rightarrow Zc$," A. Paramonov CDF/PUB/EXOTIC/PUBLIC/10045, 2010.

"Present Limits on the Precision of SM Predictions in Signatures with Jets," A. Paramonov, F. Canelli, H. J. Frisch, M. D'Onofrio, and S. Mrenna, CDF/PUB/JET/PUBLIC/10082, 2010.

"COT Momentum Scale for the W Boson Mass Analysis Using 2.3 fb^{-1} of $J/\psi \rightarrow \mu\mu$ and $\Upsilon \rightarrow \mu\mu$ Data," I. Bizjak, C. Hays, B. Jayatilaka, A. Kotwal, L. Nodulman, R. Shekhar, O. Steltzer-Chilton, S. Sun, D. Waters, Y. Zeng, CDF/ANAL/ELECTROWEAK/CDFR/10106, 2010.

"Limitations on the predictions for p_T-balance in events with a Z-boson and jets," A. Paramonov CDF/PUB/JET/PUBLIC/10196, 2010.

"Signature based Searches for new physics involving photons at the Tevatron," R.E. Blair, CDF/PUB/EXOTIC/CDFR/10347, 2010.

"Corrections for spatial variation in light collection in the central electromagnetic calorimeter," C. Hays, A. Kotwal, L. Nodulman, Y. Zeng, CDF/ANAL/ELECTROWEAK/CDFR/10520, 2011.

"Curvature Corrections from E/p of Electrons and Positrons in $W \rightarrow e\upsilon$ Decays," C. Hays, A. Kotwal, L. Nodulman, CDF/ANAL/ELECTROWEAK/CDFR/10540, 2011.

"E/p-based Calibration of the CEM for the W Mass Measurement using 2.3 fb^{-1} Dataset," I. Bizjak, C. Hays, B. Jayatilaka, A. Kotwal, L. Nodulman, T. Riddick, R. Shekhar, O. Stelzer-Chilton, D. Waters, Y. Zeng, CDF/ANAL/ELECTROWEAK/CDFR/10620, 2011.

"Measurements of the Z Boson Mass using 2.3 fb^{-1} of CDFII Data," I. Bizjak, C. Hays, B. Jayatilaka, A. Kotwal, L. Nodulman, T. Riddick, R. Shekhar, O. Stelzer-Chilton, D. Waters, Y. Zeng, CDF/ANAL/ELECTROWEAK/CDFR/10640, 2011.

"Calorimeter Counting Rates in CDF Run II," L. Nodulman, CDF/DOC/CALORIMETRY/CDFR/10684, 2011.

"A Limit on the Branching Ratio of the Flavor-Changing Top Quark Decay $t \rightarrow Zc$," A. Paramonov CDF/THESIS/EXOTIC/PUBLIC/10814, 2012.

3. ATLAS-Accomplishments: June 2009 - May 2012

3.1 Overview

Argonne is a member of the collaboration for the ATLAS detector, a general-purpose detector for the Large Hadron Collider (LHC) at CERN Laboratory. The LHC and the ATLAS detector provide data at the energy frontier that enable searches for a large range of extensions to the Standard Model and are expected to elucidate the nature of electroweak symmetry breaking. Argonne's responsibilities include constructing and operating important parts of the scintillating tile hadronic calorimeter and the trigger system, engineering work associated with the overall technical coordination of ATLAS, and core software development.

In the period 2006-2009, Argonne physicists established leadership and expertise in key areas of analyses that were to be the foundations for the future analyses program. We also began exploring signatures for exotics processes ("Beyond the Standard Model" - BSM). Our plans to explore these topics with the first LHC data were boosted by the magnificent operation of the LHC that delivered a few nb^{-1} in the spring of 2010, 50 pb^{-1} in the fall of 2010, 5.6 fb^{-1} in 2011 and an additional 3.7 fb^{-1} up to the end of May 2012. This has allowed us to carry out our initial research plan and to go far beyond it into the searches for BSM physics. The highlights of our research activities include: the jet energy scale and a measurement of the inclusive jet cross section; the underlying event in minimum bias interactions; prompt photon production; QCD production of W bosons plus jets; development of jet substructure variables, their comparison with QCD, and their use in searches for decays of heavy boosted objects; and searches for SUSY in a variety of signatures. Members of the group have made significant contributions to ATLAS detector operations associated with the tile calorimeter, the trigger and data acquisition systems, software and computing, and efforts aimed at consolidating our roles in detector upgrades. The Argonne Analysis Support Center (ASC) is now firmly established and has been the focus of several ATLAS physics analysis teams as well as a center for visiting graduate students and research faculty. The ASC has realized the goal, from 2009, of providing an environment that enables participation in ATLAS research by staff and students from local (and some not so local) universities. Finally, in addition to our scientific and technical roles in ATLAS, members of the group have held important leadership positions in ATLAS and in US-ATLAS. Each of these areas is discussed below in more detail.

3.2 Scientific Research

Jet reconstruction and jet energy calibration is central to a huge fraction of the physics at the LHC. Proudfoot, together with postdoctoral fellows Fullana and Salvachua (who have now moved on to a Marie Curie Fellowship and CERN Fellowship, respectively) have contributed to the measurement of jets using the electromagnetic scale, and also to the calibration scheme termed global cell-weighting that uses cell energy density relative to the jet energy to weight individual cell contributions to the jet. This was the primary calibration for jets for all of the pre-data taking physics studies and many of the early physics analyses. Fullana and Salvachua also participated in the measurement of the inclusive jet cross section [1] – one of the key analyses requiring a well understood systematic uncertainty on the jet energy scale.

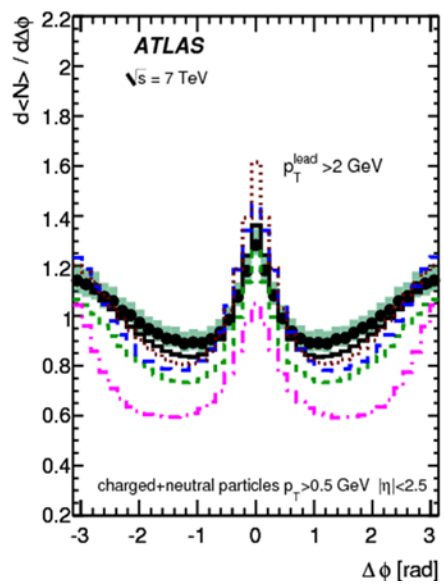

Figure 3: Cluster density as a function of azimuthal separation from leading clusters with P_t > 2 GeV.

As an early test of QCD, Chekanov, Yoshida, Proudfoot, and J. Zhang undertook a measurement of energy flow in soft QCD events (minimum bias). They participated in the analysis based on charged particles and led the study using clusters reconstructed in the calorimeter. The latter analysis is the first time at ATLAS where this measurement was made using the full final state of charged and neutral particles. It is also significant since the systematic uncertainties in this analysis are independent from those in the measurement made using charged particle tracks. We were the first group to determine the energy scale in the ATLAS electromagnetic calorimeter using calorimeter energy clusters to reconstruct the π^0, and compared the reconstructed mass in data with that in simulation to obtain an *in situ* estimate of the energy systematic uncertainty for low energy particles. The fitted mass was 130.9 ± 0.2 MeV, in good agreement with the PDG value within the 3% systematic uncertainty of the energy scale at that time. A representative cluster-based density distribution is shown in Figure 3 (from [2]), in this case for leading P_t clusters with transverse momentum $P_t > 2$ GeV. In addition to providing essential data to tune particle production in Monte Carlo generators, these data establish the meaningful use of clusters as observables for use in jet shape quantities such as eccentricity, mass, and planar flow.

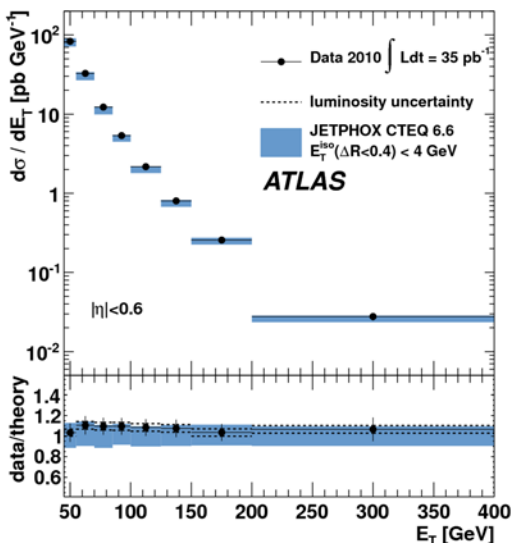

Figure 4: Prompt photon cross section measured with early ATLAS data.

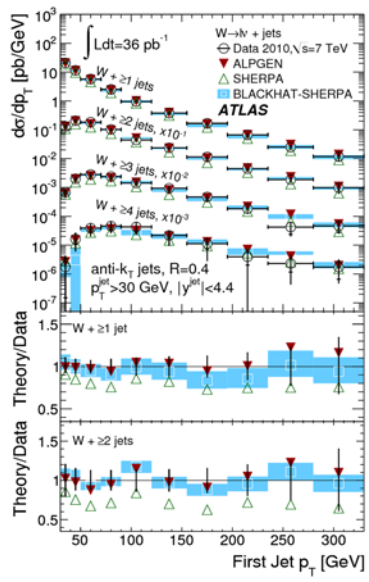

Figure 5: Comparison of theory to experimental data in the W + jets cross section.

Chekanov, Blair, and Norberg (University of Oklahoma, graduate student, ASC visitor) have had a significant impact on all direct-photon analyses starting from the first ATLAS publication on 2009 data [3]. A key contribution to this analysis came from the production, at ANL, of Monte Carlo data sets used to understand the systematic uncertainty coming from jet fragmentation - a major issue relevant to isolation in the identification of prompt photons. Similarly, we made the Monte Carlo calculations using JETPHOX [4] for comparison with the experimental data – a non-trivial effort and one which was feasible through the considerable computing resources available at the Argonne Analysis Support Center. Figure 4 shows the photon cross section measured in early data. Currently, Chekanov and Blair are leaders in the ATLAS Standard Model group to analyze and publish the inclusive direct photon cross section using the full 2011 dataset that will extend the photon cross section measurement to the 1 TeV region.

Another important Standard Model process is the production of vector bosons in conjunction with jets. Maria Goeppert Mayer Postdoctoral Fellow Paramonov has led the analysis of W + jets and been the coordinator of the ATLAS W + jets sub-group since fall 2010. This analysis realized a new level of comparison with theory by measuring the W + jets process for up to 4 jets; Figure 5 shows one such comparison. All of the analysis in the muon channel was carried out at Argonne. In addition to understanding the systematic uncertainty due to the jet energy scale, many detailed studies were required to determine the major impact of lepton reconstruction variables, such as isolation, and to estimate fake rates in order to produce a publication which, with only 35 pb^{-1} of data, is already systematics limited [5]. The analysis also introduced new variables to compare to theory, and for the first time, a comparison to the state-of-the-art Next To Leading Order calculation for events with up to 4 partons in the final state (BLACKHAT-SHERPA [6]). Paramonov, together with others in the W + Jets analysis subgroup, studied the di-jet invariant mass in events with W + 2 jets to determine if the bump reported by the CDF experiment was also observed in ATLAS data. This analysis was carried out with very high priority following the CDF publication. No enhancement was found and a conference note documenting the results and setting limits on a possible enhancement written [7].

Following on from the analysis of energy flow in minimum bias events, Chekanov, Yoshida, Proudfoot and J. Zhang together with postdoctoral fellows Asquith and Auerbach have studied the use of jet substructure as a way to search for new physics. Examples of areas of such applications are searches for decays of exotic resonances to boosted top quarks and searches for Higgs boson decays to two b-quarks, or τ's, where the decay products are reconstructed in the same jet object. This substructure analysis, since it is based on the use of clusters of energy measured in the calorimeter, builds directly from the soft QCD analysis we carried out with early data. In a test of QCD, we studied the measurement of the mass, width, eccentricity, planar flow and angularity of jets using the anti-Kt jet reconstruction algorithm for different distance parameters. These measurements have been compared to the predictions of Monte Carlo generators that match Leading Logarithmic parton showers to Leading Order and Next to Leading Order matrix elements. In performing this analysis, we developed a technique for correcting the jet shapes for the effects of pileup. Overall, the generators are able to describe the general features of the jets, though discrepancies are observed in the details of some distributions. We have been one of the leading groups studying jet mass for jets at high transverse momentum. This is shown Figure 6 [8], where we compare the unfolded data distribution with a Next To Leading Order QCD calculation. A journal article is in preparation. This analysis is being repeated with the 2011/12 dataset and extended to a study of b-jets.

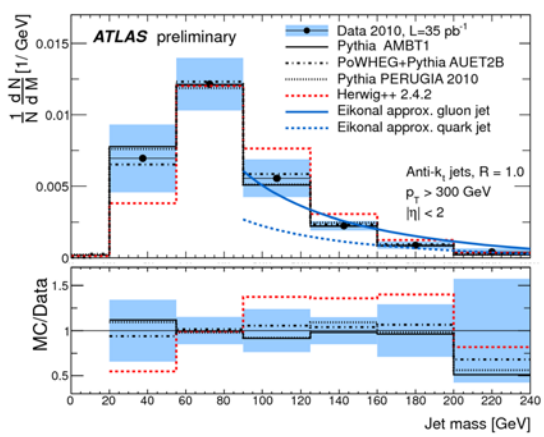

Figure 6: The mass distributions for R = 1.0 jets in the full 2010 dataset, corrected for pileup and corrected to particle-level.

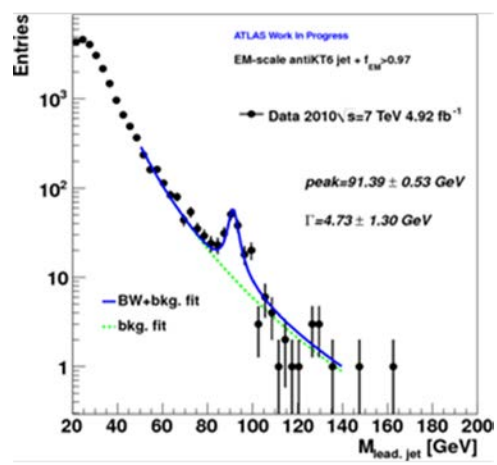

Figure 7: The mass distributions for R = 1.0 jets in the full 2010 dataset, corrected for pileup and corrected to particle-level.

Event selection using substructure variables has also been applied in a search for the decays of heavy boosted-objects and has isolated a sample of Z-boson decays in highly electromagnetic jets at high P_t, in which both electrons from the decay of the Z are reconstructed inside the same jet. The mass distribution for the "electromagnetic" jets is shown in Figure 7, where the mass peak of the Z-boson is clearly seen. This approach provides increased acceptance for Z bosons decaying to electrons at high P_t, since in the standard reconstruction the efficiency drops due to the isolation requirement made on each electron. This approach has the potential to provide an independent measurement of the Z P_t at high P_t; it can provide a sample of Z-bosons at high P_t for use in jet energy calibration; and it can provide a sample of events which can be used as a calibration dataset for jet substructure variables.

LeCompte, together with postdoctoral fellow Nguyen are engaged in the search for Supersymmetry (SUSY). SUSY is a popular theory, as it provides an explanation for the stability of the Higgs boson against radiative corrections, and, additionally a dark matter candidate. Despite the fact that the natural range of masses for SUSY particles is in the few hundred GeV range, no such particles have ever been found. One explanation for this is *compression*: the SUSY particles lie closer together in mass than is generally assumed, and this reduces the acceptance of the experiments. The sensitivity of the LHC to these spectra were explored in two papers by LeCompte and Stephen Martin (Northern Illinois University) [9,10], where it was realized that the standard search for squarks and gluinos in the zero-lepton channel had substantial sensitivity to "mild" compression (Figure 8), but that the sensitivity could be enhanced by re-optimizing the selection requirements.

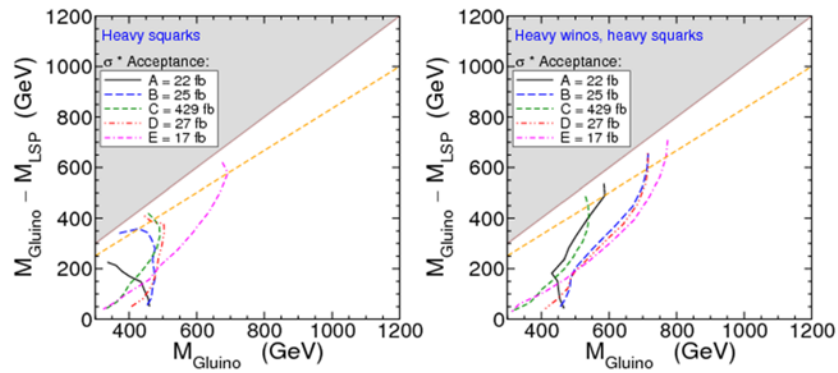

Figure 8: Sensitivity of LHC to squarks and gluinos in a Compressed SUSY model as described in the text.

Based on this work, the 2011 zero-lepton analysis has a dedicated search region to enhance the experiment's sensitivity to compressed spectra. There is no significant excess observed, and the limits obtained will be published in an article that ATLAS is about to submit to Phys. Rev. D. This search will continue with the 2012 data. At present we are investigating adding additional compression-sensitive search regions with higher jet multiplicities; the hope is that these will lead to sensitivity to models that can accommodate a 125 GeV Higgs boson.

In summary, the research program of the Argonne ATLAS group has taken full advantage of the data provided by the first 2 years of running of the LHC. We have engaged in performance studies, tests of the Standard Model and have contributed to searches for physics beyond the Standard Model. References [1-3, 5, 7, 11] are ATLAS publications to which Argonne physicists made significant contributions. In addition to those studies described above, we have adapted our analysis program as analyses were completed and published, and have several developing exotic searches: ttbar resonances (Chekanov); SUSY in tri-leptons (Paramonov); SUSY in photon plus Missing E_t (Auerbach, Amanda Kruse (University of Wisconsin graduate student, ASC visitor and Scarlet Norberg (University of Oklahoma graduate student, ASC visitor); SUSY in Missing E_t + jets; and in searches for the Higgs boson (J. Zhang, Proudfoot, Feng, and Asquith).

3.3 Detector Operations

The Argonne group provided significant effort to ATLAS detector operations in this period: to the tile calorimeter system (TileCal); to the ATLAS Trigger and Data Acquisition system; and to the design, construction and testing of replacement power supplies for the Tile Calorimeter. In the period from 2010 to date, Argonne physicists have met their obligations to ATLAS operations for each of the three categories of ATLAS shifts: Class 1 which comprises shifts in the ATLAS Control Room (provided 247 for an allocation of 247 shifts through the end of 2012); and Class 2 and 3 which are different categories of expert task. Argonne staff contributed 1002 "shifts" for Class 2 for an allocation of 804 and about a factor of two more effort in Class 3 (due to the presence of a significant level of effort in software and computing in the group).

Tile Calorimeter Detector Operations

In this period, Chekanov, LeCompte, Nodulman, Proudfoot, Yoshida, current postdoctoral fellows Asquith and Nguyen, and former postdoctoral fellows Fullana and Salvachua have contributed to TileCal detector operations. Argonne physicists took Calorimeter shifts in the ATLAS Control Room and in addition some members of the group took on key expert tasks associated with tile calorimeter operations in this period. Of these tasks, three required significant time at CERN: TileCal Run Coordinator, Tile DCS/DAQ expert on call, and TileCal Data Quality Leader. Several members of the group served as TileCal Data Quality Validator – a task that could be done remotely from Argonne.

The group has focused additional effort on monitoring the performance of the low voltage power supplies (LVPS) and was one of the first groups to notice the trips of these supplies during beam operations (as early as December 2010). As this was an important issue to follow in real time, Chekanov and Proudfoot together with Norberg (Oklahoma) developed, and now maintain, the web-based monitoring software which is currently used by the TileCal community and TileCal shifters to monitor such trips [13]. The tool is also used to study the possible root causes of the trips, and several communication notes have been written describing the results. Norberg met her ATLAS qualification credit from this work. In addition to providing TileCal with an extremely useful tool, this work demonstrated categorically the possibility of making a direct contribution to ATLAS operations without being physically present at CERN.

As part of an effort to understand the underlying cause of these trips, Proudfoot and electronics engineer Drake are collaborating with Bruce Mellado (Wisconsin) and two engineering students at the University of Wisconsin to develop a phenomenological model for single event upsets. The model of Bendel [14] is the basis for this study, and our plan is to extract the model parameters by fitting them to the results of beam irradiation of low voltage supply components. This model parameterization can then be used together with Monte Carlo predictions for the radiation field in the ATLAS cavern to obtain an estimate of the intrinsic probability for power supply trips due to a single event upset.

Additionally, Argonne is responsible for the TileCal databases. These include the results of the rather extensive set of calibrations that are carried out, for example: source runs, laser runs, cell noise constants, and PMT currents. This information feeds directly into Monte Carlo and reconstruction. The maintenance of the TileCal databases, database interfaces with the evolution of the ATLAS code base, and database interfaces is a large part of this task.

Tile Calorimeter Replacement Low Voltage Power Supplies, Testing and Production

The original low voltage power supplies (LVPS) for TileCal had several operational problems that required a large scale repair in the period from 2007-2009 in order for them to be adequate for operation. In this period several of these supplies failed, demonstrating a problem with reliability. It was also recognized that the supplies caused an increase in noise in the readout electronics. ATLAS took significant data during 2011, and yet another serious problem with these original supplies was observed: they would trip during beam operations (Figure 9). These trips occur with a frequency proportional to the delivered luminosity, although the precise mechanism remains somewhat unclear. If no steps were taken, we would expect tens of thousands of trips per year, approaching one million over the life of ATLAS.

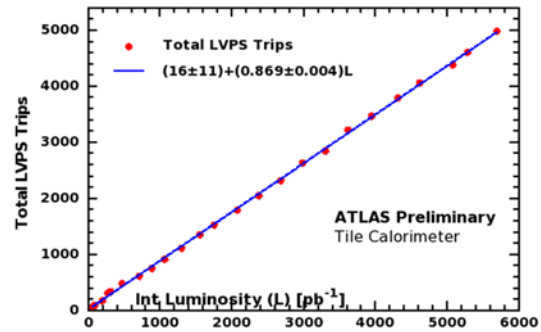

Figure 9: The number of trips vs. integrated luminosity, in data taken in 2011

While Argonne did not design the original power supplies, we took on a major additional responsibility for TileCal; that of designing, building and testing replacement power supplies. Led by Drake, engineers in the ANL-HEP Electronics Group began the redesign by first cataloging the problem areas in the original supplies. Some of these problems were straightforward: insufficient voltage margin on key components (a factor of two in the case of some capacitors); failure to meet standard assembly spacing on components; insufficient grounding; poor thermal management. Some, however, were more intricate, such as the redesign of the voltage feedback loop and startup circuit. The initial design for the new powers supplies was completed in 2010. This design was reviewed internally by ATLAS in summer 2010, following which 40 prototype LVPS units were assembled and installed on the TileCal in the 2010-11 winter shut down. Each LVPS unit supplies a single voltage and eight units power an electronics drawer. There are a total of 2048 LVPS units in the TileCal system.

Sample board components and powered units have been exposed to a total radiation dose of 37 kRad from a Co^{60} source. The results showed that, with minor degradation in performance, the units would perform for 10 standard years of LHC operation at a luminosity of 10^{34} cm^{-2} s^{-1}. Units were also studied for potential single event upsets using proton beams. Single event upset in the controller chip was observed in these exposures and design changes were made to ensure that, in the case of a single event upset, the power supply would not trip or damage the electronics that it powers. The results of these radiation damage tests are being documented in ATLAS internal notes and show that this new design will function for the radiation exposure expected before the long shutdown scheduled around 2022 when the entire front-end electronics system will be replaced. This design was approved by ATLAS and 320 pre-production LVPS units were assembled and tested in an intensive period of activity in October 2011. They were installed on the detector in the 2011-12 winter shut down.

In 2011, during which ATLAS accumulated over 5 fb^{-1} of data. There was only one trip of the prototype LVPS units during beam operations, whereas the best of the old units tripped 14 times. There were a total of ~5000 trips in the TileCal system. While it is difficult to be precise with only a single trip, the indication is that the new supplies have a trip rate that is at least 30 times and probably 100 times smaller than the original ones. We have closely monitored the performance of the 320 pre-production LVPS units installed in the 2011-12 shut down. These are a slightly newer version with improved radiation tolerance. As of May 22nd, none of these has tripped during beam operations; at 95% CL these are at least 100 times better than the original power supplies.

Production of the replacement supplies is proceeding well. Over 200 units have been shipped to CERN and the production and testing rate is approaching the planned value of 80/wk.

Region of Interest Builder/TDAQ Operations tasks & responsibilities

Physicists Blair and J. Zhang together with engineering assistant Fellmann, and postdoctoral fellows Auerbach and Paramonov have contributed to Region of Interest builder and Trigger and Data Acquisition System (TDAQ) Operations.

The Region of Interest Builder (RoIB) assembles information from the Level 1 system to allow the level 2 system to identify which objects caused the level 1 trigger and where in the detector these objects were located. This system was built by Argonne in collaboration with Michigan State University. It consists of custom VME cards with S-Link (a standard CERN serial communication link) input and S-Link output. It receives eight level 1 S-Link inputs, assembles them into event summaries and distributes them to five level 2 supervisors (PC's with cards to receive the S-Link event summary data). The level 2 supervisors select level 2 processing units (L2PU) to make the trigger decision and send the level 1 information to the selected L2PU. The custom hardware is supported during operation by a small team from Argonne and MSU.

When the detector is running, a member of the support team is on call 24/7 to handle any hardware failure since the detector cannot take triggered data without the RoIB. Scheduling and coordination with TDAQ management for this has been handled by Argonne staff. In addition, Fellmann has been responsible to make any software changes required to improve monitoring, adapt to framework updates or address bugs that are detected during operation. During this period there were three production releases of the TDAQ software. Some of the areas that required software changes for which we were responsible include adjustments to accommodate state machine improvements, bug fixes, and improvements in how the software cleared data from the RoIB when runs ended abnormally.

In general the uptime of the hardware was very close to 100% but a number of issues required our attention to assure that this condition persisted. We had two cases where interfaces to and from the RoIB failed. These had to be diagnosed and fixed. The RoIB crate had to be outfitted to allow powering the system down and up remotely via DCS (Detector Control System). Tests were done to verify that when level 1 components increased their maximum fragment size, the system performed properly. There were system freezes when one of the level 1 systems was misconfigured. We verified that this was not due to a RoIB mishandling of component timeouts.

We developed and supported training and documentation for the on-call team. We participated in tests of each TDAQ software release at CERN that involved runs on the pre-series system (a small system for checkout at Point 1) followed by runs on the final system. We specified and tested upgrade hardware for rolling replacements of parts of the pre-series and the production system. A test setup is also maintained at Argonne to provide a place where any failed boards can be tested and software can be checked. This system is kept up to date with the latest TDAQ release package. It is also used to benchmark prototypes for upgrades.

In addition to explicit responsibility for the RoIB, J. Zhang, Blair, and Paramonov contributed to several key operations tasks in the TDAQ system in this period: planning and coordination with other ATLAS TDAQ personnel for commissioning, technical runs and operation; providing TDAQ expert support for the collaboration; member of DAQ/HLT steering group; deputy convener of Minimum Bias Trigger Signature group, and ATLAS Run Manager.

3.4 Software and Computing

Members of the Argonne software team continued to hold leadership positions in two major activities: Software and Computing, and Data Preparation. These responsibilities include coordination responsibilities for the event store (van Gemmeren), metadata (Malon), TAG database (Cranshaw, Q. Zhang), distributed database deployment and operations (Vaniachine) and integration of many of the above services with analysis tools. By the end of FY 2011, ATLAS I/O and data persistence infrastructure, the development and delivery of which were led by the Argonne team, were successfully supporting event data volumes fast approaching 100 petabytes.

Many contributions were made to reduce the storage footprint, and to optimize the persistent data layout for improved performance both for sequential access and for selective reading. The persistent layout granularity was adjusted to match the coarser transient retrieval pattern, reducing the number of branches by over an order of magnitude. Fewer branches resulted in fewer disk reads to retrieve an object and enabled ATLAS to flush small chunks of events to disk, rather than first collecting over 30 MB. This resulted in reduced memory footprint of applications for reading or writing data (by about 50 – 100 MB), somewhat faster sequential reading (15 – 30%), and much faster reading of event selections (e.g., a 1% selection is 4 – 5 times faster).

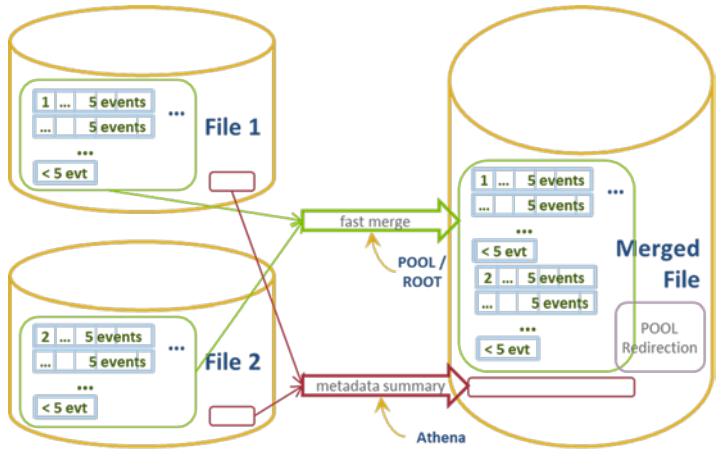

Figure 10: Diagram of the new merge utility.

The Argonne group delivered I/O framework infrastructure in support of multi-core processing, and has integrated this work into the ATLAS multiprocessing control framework known as AthenaMP. The model of multi-core processing where multiple workers handle I/O independently using distinct instances of a serial I/O framework required new functionality such as the capability to seek to subsets of events processed by the worker. Such a model, may suffer serious inefficiencies, with multiple workers redundantly reading the same buffers of compressed data containing events that are processed by a different worker. On output, combining the files of multiple workers was a huge bottleneck, reducing the event throughput of AthenaMP by about 30% (vs. no merge). A utility, which uses "Fast Event Data Append" and a reference redirection layer, was developed and combined with in-file metadata propagation done by the Athena framework (Figure 10). This new capability reduces the total merge time by almost an order of magnitude.

An event-picking infrastructure was developed with contributions from the Argonne team and others, which supports direct navigation to, and processing of, individual events of interest, allowing ATLAS physicists to run over a specific list of events rather than complete datasets. Event-picking utilizes the TAG database and event store navigational infrastructure.

3.5 Upgrades

Although the LHC has been operating for physics only for little more than 3 years, planning for longer-term upgrades aimed at maintaining and improving detector performance associated with evolving physics goals and anticipated increases in the instantaneous luminosity has begun. Members of the group have contributed to several upgrade studies: for the tile calorimeter front-end readout electronics; for the evolution of the Region of Interest Builder; and in the development of a significant addition to the ATLAS trigger system, the Fast Tracker.

Tile Calorimeter

Price has been co-leader of the tile calorimeter upgrade steering group until the end of 2011 and was co-writer/editor of the upgrade Letter of Intent put forward by this system and, together with Proudfoot, Yoshida and LeCompte, and electronics engineer Drake, contributed to TileCal upgrade R&D in the Division. The Argonne group has focused on upgrades associated with the front-end electronics which build on prior contributions to ATLAS and to other experiments. We are the lead institution proposing the replacement of the front-end shaper and digitizer system with a custom readout chip (the QIE) and are collaborating with engineers at Fermilab on the design of the chip to be developed for the read out of the hadronic calorimeter of CMS such that it also meets the

requirements for the TileCal. Building on our work on the low voltage power supplies, we are the lead group for the development of redundant power supplies to be located in the calorimeter "fingers" and point-of-load regulators to service the drawer electronics and PMT high voltage system. Generic detector R&D in the Division has identified a potentially attractive solution for high bandwidth optical links to be used to transmit the digitized data to the ATLAS Readout System (ROS). We have communicated this information to ATLAS and plan to develop a scheme to integrate it as an option into the existing scheme for optical links from the drawer to the ROS.

RoIB Evolution

The RoIB was designed and built in 2004 to 2005 and is beginning to show its age as components and modules used in it become obsolete. The system has functioned very reliably so far, but will need to be upgraded if not replaced relatively soon to ensure that it does not fail with catastrophic consequences. Physicists Blair and J. Zhang, together with engineering associate Fellmann have evaluated options for the ongoing evolution and/or replacement of the current RoIB.

At about the time that the current system was commissioned, an attempt was made to use an S-Link equipped PC to perform the same functions as the hardware RoIB. The rate achieved was well below the required rate. The computing landscape has changed substantially in the intervening period, and plans for the high level trigger (HLT) architecture are tending toward consolidating functionality to make better use of multi-core computers. Tests are in progress at Argonne to re-evaluate a software-based RoIB, but more work is required to reach a final conclusion.

In anticipation of an upgrade path that would involve a modest amount of custom hardware a shelf with two processor blades based on an Advanced Telecommunication Computing Architecture (ATCA) was added to the RoIB test bed. This system runs the TDAQ software and with the addition of a custom input card, a rear transition module (RTM), can be tested in a small TDAQ system to demonstrate an alternative to the VME based system currently in use. A single RTM in conjunction with the consolidation of the functionality of the multiple level 2 supervisors would be a follow on to the current system.

Fast TracKer

The Fast TracKer (FTK) is a hardware track finder designed to enhance the existing Trigger and Data Acquisition (TDAQ) system of ATLAS. It will provide global track reconstruction at the full ATLAS Level-1 trigger rate. J. Zhang contributed to the Technical Proposal, submitted in 2010. The FTK project was approved as an upgrade project by the ATLAS Collaboration management in June 2011. The work areas of the Argonne group in the last three years include: developing the physics performance and overall system design, designing the interface to the current TDAQ Level-2 trigger system, and building a test system to evaluate the integration concepts (the vertical slice testbed). J. Zhang leads this effort in collaboration with Blair, Proudfoot, and postdoctoral fellow Auerbach.

The goal of the overall system design is to achieve the required physics performance while using affordable resources. In collaboration with other groups, the ANL group produced different simulation data samples with respect to various detector occupancies and LHC luminosities. We studied the execution, transfer behavior, and system performance, with corresponding FTK configurations, then iterated the process to reach an optimal design. Based on this, the baseline design has been defined for component R&D to be carried out in next few years. We finished the link specification between the FTK core crates and the TDAQ Level-2 system and are finalizing the data formatting reference document for the project.

The design of the interface of FTK to the current TDAQ LVL2 system (FLIC) is proceeding well. The Argonne FTK team, together with engineers from the ANL-HEP electronics group, have finished the specification and started the board design. A layout is close to complete and the board is expected to be fabricated and ready for testing by summer 2012. A test bed based on ATCA technology is being assembled at Argonne.

A vertical slice testbed is being assembled at CERN to provide a platform within which system components can be tested in the ATLAS TDAQ environment. J. Zhang has been acting as the coordinator to implement the vertical slice and integrate it into the ATLAS operation. He supervised the installation and testing of the Duo-output readout cards (HOLA), demonstrated the Readout System (ROS) performance and identified the constraints for the final FTK system. Working closely with other TDAQ subsystem experts, he identified the critical tasks for vertical slice implementation, and identified the technical solutions.

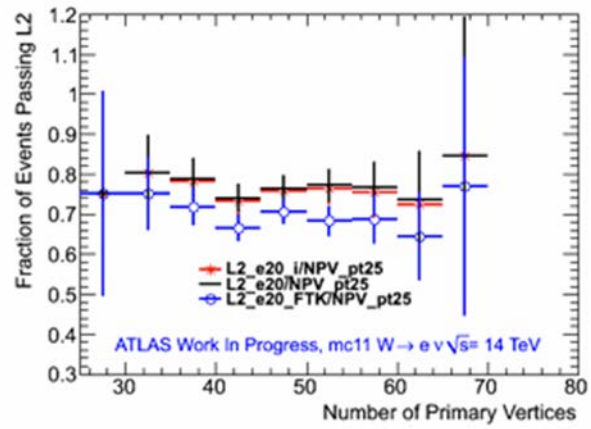

Figure 11: Fraction of events in $W \rightarrow e\nu$ passing track isolation cuts using FTK tracks compared to L2 calorimeter e/γ trigger.

A robust but simple trigger configuration must be developed for high luminosities that take advantage of FTK capability. The Argonne FTK team has been focusing on electron isolation performance. Initial results have been produced and are being used to establish signal efficiency and background rejection baselines from which to begin optimization of the full trigger chain. The FTK tracking is simulated and detector-level hits connected with a helical trajectory are produced. The trajectory with the best chi-squared fit is chosen as the track. The track information from all such reconstructed tracks, along with additional information (such as number of pile up vertices) is then used to investigate the performance of an additional trigger that uses FTK. The additional trigger will exploit the difference between electrons originating from W and Z boson decays and electrons that emerge from hadronic decays such as B decays, which are generally accompanied by additional particles. A preliminary result of this study is shown in Figure 11. Combining FTK and calorimeter isolation allows us to increase efficiency for a given background rejection.

3.6 Analysis Support Center

In 2006, Analysis Support Centers (ASCs) were established as a part of the analysis support structure of US-ATLAS. The three centers are at ANL, BNL and LBNL. The mission of the ASCs is to provide US-ATLAS physicists with regional resources, tutorials, support leadership and a focal point for analysis-related activity. They provide infrastructure as well as expertise in certain areas of detector performance. Up to and including 2009, ANL ASC emphasized its pedagogical role, and held bi-monthly "Jamborees" for US-ATLAS. Through these tutorial/meetings, about 100 US-ATLAS members received their initial introduction to, or improved their knowledge of, the ATLAS analysis environment. Recent US-ATLAS surveys of the ATLAS institutes indicate that this expertise is now widely disseminated.

	Jamborees held	**Tier3 meetings held**	**Long-term visitors**	**Summer students**
FY2009	5	1	5	2
FY2010	4	1+1(at CERN)	7	3
FY2011	1	1	14	3
FY2012	1	--	15	4

Table 2: Summary of activities and visitors at the ANL ASC

Around 2009, in view of the imminent arrival of LHC data, we began to make a strategic shift in the emphasis of the ANL ASC to transform the center from a mainly pedagogical one based on periodic meetings to a true analysis center that serves as a home base and a support structure for those ATLAS analyzers who are in the United States.

Following the milestones and plans set up at that time:

- We increased the physics content of the Jamborees while decreasing the number of pedagogical Jamborees. The Jamborees are now held once or twice a year with emphasis on physics topics being worked on at the ANL ASC. These are supplemented by ANL ASC participation in other meetings with a wider participation than only US-ATLAS; these were jointly organized by CTEQ, Fermilab LPC, the DESY Analysis Support Center and the ANL ASC.
- We increased the number of long-term visitors from about 5 in FY 2008 to 15 in FY2012. A total of 22 long-term visitors have utilized the ANL ASC to work on their analysis to date. The visitors were from Oklahoma, Northern Illinois, Wisconsin, Chicago, Iowa State, Michigan State, Duke, and Tufts Universities, as well as a visitor on Fulbright Scholarship from Morocco. Two of the 22 are recipients of the ATLAS ASC Fellowships awarded by US-ATLAS for FY2012. Of the 22 visitors, 12 are graduate students. Of the 12, six are ANL ASC Graduate Student Fellows (1-year awards) which are locally established and supported by the Laboratory. These students have ANL Staff advisors who, in cooperation with their University Advisors, set and supervise research projects and technical tasks.
- We made improvements to the physical infrastructure of the ANL ASC. Taking advantage of some reorganization at the Laboratory, ANL ASC has, as of 2011, a suite of offices that are optimally configured for collaborative atmosphere and has enough space to host a large number of visitors. We now have dedicated secretarial help as well as improved technical support.
- We began to regularly support Summer Undergraduate Interns under the SULI program. Their work is integrated with the ATLAS research topics being carried out at the ANL ASC, and in general, they make significant impact so that most contribute to ATLAS internal notes. In the case of Andrew Johnson, his contribution was such that his name was added to the author list of a journal publication.

The visitors at ANL ASC together with ANL ATLAS members have contributed significantly to the following analysis areas (many of which are described in section 3.2):

- Underlying events and soft QCD, jet mass and shape studies, prompt photons, inclusive jet cross section, W bosons + jets
- Top physics*
- WZ, WW, and $Z\gamma$ production
- Higgs to $\gamma\gamma$*, Higgs to BBbar
- Boosted objects searches
- SUSY searches

The subjects marked with asterisk are those being carried out at the ASC by visitors, but do not have a direct involvement of ANL ATLAS group members. The activities at ANL ASC are summarized in Table 2.

Tier 3 and ANL ASC

In 2008, ANL released an ATLAS internal note on Tier3 computing based on our experiences providing computing for the ASC. In the report produced by US-ATLAS Tier3 Task Force, ANL Tier3 along with Duke University Tiers3 was reported as a model for US-ATLAS. With the Tier3 funding to Universities becoming available through ARRA, ANL held the first US ATLAS Tier3 meeting at ANL in May, 2009.

In September 2009, US-ATLAS named Yoshida (ANL) and Doug Benjamin (Duke, ASC visitor) to be US-ATLAS Tier3 coordinator and deputy, respectively, and charged them with providing guidance on the design and to provide support for the US-ATLAS Tier3s. Yoshida and Benjamin took surveys of Tier3 needs in the US and held an organizational meeting for US Tier3 on Oct 2009 at ANL ASC where all US ATLAS institutes funded to build Tier3s were represented. In this meeting, an agreement on broad design goals for US ATLAS Tier3 was achieved. The key element of the design was ease of set up and maintenance, given the limited manpower resources of most groups, while delivering the analysis power needed.

In the ensuing months, close collaboration on the design effort was established with many groups including Open Science Grid, Virtual Data Toolkit, Condor team, CernVM (Virtual Machine) group, ATLAS Canada, XrootD developers as well as the US-ATLAS software and facilities groups. At the same time, contacts were made with

ATLAS Distributed Computing organization and US-ATLAS Tier3 plans were integrated into ATLAS plans. In January 2010, Yoshida and Benjamin along with ATLAS Distributed Computing organized an ATLAS wide Tier3 meeting held at CERN. In June 2010, Benjamin was named Tier3 technical coordinator for the ATLAS collaboration.

The design and testing of suitable US-ATLAS Tier3s took place at ANL ASC. A test cluster was set up and the basic design and installation procedures were worked out. The on-going analysis work at ANL ASC was an important component in evaluating and making design decisions. Based on this work, detailed Tier3 setup instructions were completed that included hardware recommendations.

Throughout fall 2010 and 2011, Tier3s were set up in US-ATLAS institutes following the guidelines and support based at ANL ASC. Currently, there are 42 US ATLAS Tier3 sites (amounting to 3.5k cores and 2.5 PB storage in aggregate) operational. According to a recent survey, all institutes that responded rate the Tier3 as being a very important or a critical component of their analysis efforts.

Computer farm of the ATLAS group and ASC: ANL-Tier3

The computer infrastructure used by the ANL ATLAS group, and by the ASC visitors for ATLAS publications and communication notes was established in 2009. At that time the number of computer servers increased from 3 to 30. The computer farm, which currently includes 240 processing cores for batch jobs and a 100 TB data storage, was designed to match future data-analysis challenges faced by the Argonne group and ANL visitors.

The design of the ANL-Tier3 is based on the Argonne effort to build a low-cost computer farm for distributed data processing based on multiple hard drives without extensive usage of network bandwidth (typically limited to 1 Gb at Tier3s). Later, elements of this design were included into the ATLAS-wide Tier3 recommendations. In 2009, dedicated software was developed for job submission of ATLAS-specific applications ("Athena") and general-purpose applications that require input files (the so-called D3PD, NTUP etc. data formats) using the distributed data-analysis model. The computer cluster to date has been used for 10 ATLAS physics analyses (8 ATLAS published papers) and for at least 50 communication notes. This cluster is also used for tutorial type Jamborees held at the ASC, and periodically support up to 80 users.

The computer farm is presently migrating to Bld.240 at Argonne (built for the Blue Gene/Q) in order to leverage the infrastructure of the Argonne Leadership Computing Facility with centralized cooling, uninterruptible power supplies and 20Gb networking. This migration will finish by the end of the summer 2012.

ASC Visitors (2009-2011)

One of our key goals for this period was to establish the ANL ASC as a place where physicists, generally in the region, would come and collaborate with us and each other both on physics analysis and on detector operations or hardware projects in the group. We had tremendous success and list the visitors below together with a sentence describing their activity and connection to the work of the ASC:

Summer Students (& projects):

- **Jason Boomsma** (2009): InvMass, a program which executes a generic search for undiscovered particles using ATLAS at the LHC
- **Nathan Gardner** (2009): Analyzing cosmic muon data collected with ATLAS
- **Zach Epstein** (2010): Reconstruction of K0s, Lambda, and Lambda-Bar using 7 TeV data
- **Craig Levy** (2010): Using Jet-shapes in the Search for TeV-Scale Particles at the ATLAS Detector
- **Andrew Johnson** (2010): Estimation of QCD Backgrounds for W->$\mu\nu$ + N-jets Using Template Method
- **Michael Erikson** (2011): On non-parametric peak finder algorithm and its application for general searches of new physics
- **Linus Marchetti** (2011): Estimation of dijet backgrounds to $Z\rightarrow\mu\mu$ decay with the matrix method and in situ determination of muon identification efficiency and jet to muon fake rate

- **Jack Weinstein** (2011): Explore, evaluate, and contribute to emerging technologies for large-scale scientific databases

ASC Graduate Student Fellows (& research projects):

- **Chad Suhr** (Northern Illinois University, 5/2011-5/2012): Tile calorimeter online monitoring, single top sensitivity studies
- **Scarlet Norberg** (University of Oklahoma, 5/2011-5/2012): Tile Calorimeter low voltage power supplies monitoring, prompt photon studies
- **Amanda Kruse** (University of Wisconsin, 10/2011-10/2012): Tile Calorimeter signal reconstruction, $H\rightarrow$ to $\gamma\gamma$ systematic uncertainty studies

Visiting Graduate Students

- **Robert Calkins** (Northern Illinois University, 2010-)
- **Stephen Cole** (Northern Illinois University, 2010-2011)
- **Brian Martin** (Michigan State University, 2008-2011)

ASC Fellowships

- **Adam Yurkewicz** (Northern Illinois University)
- **Chunhui Chen** (Iowa State University)

Visiting Faculty/Staff

- **Doug Benjamin** (Duke University, 2008-)
- **Jerry Blazey** (Northern Illinois University, 2009-2011)
- **Dhiman Chakraborty** (Northern Illinois University, 2008-)
- **Al Goshaw** (Duke University, 2011-)
- **Guilherme Lima** (Northern Illinois University, 2008-)
- **Simona Rolli** (Tufts University, 2009-2011)
- **Vishnu Zutshi** (Northern Illinois University, 2008-)
- **Yahya Tayalati** (Université Mohammed Premier Oujda, Morocco, 2011)

3.7 ATLAS Leadership Positions

The leadership positions held by members of the Argonne group in this period are:

- *Physics Coordinator*: The Physics Coordinator is elected by ATLAS and is responsible for the scientific output of the experiment; reviews and approves all publications and preliminary results; sits on all major ATLAS management boards; is an ex-officio member of the Speakers and Publication committees; appoints physics conveners. Position held by Tom LeCompte (2009-2010) {Deputy 2008-2009}.

- *Conveners*: Responsible for a particular physics or combined performance topic. The convener does the day to day organization of the physics analyses and determines when a given analysis is sufficiently advanced to go public; may appoint subgroup "sub-conveners" as needed. Jet/ETMiss Performance Group Convener held by Jimmy Proudfoot (2007-2009), appointed by Tile Project Leader; Standard Model Physics Group Convener held by Tom LeCompte (2006-2008), appointed by Physics Coordinator.

- *Tile Calorimeter Institution Board Chairman*: Chairs IB meetings at each Tile Week to discuss management and technical issues with leaders of the institutes; provides advice to system leader as needed on budget planning and operations tasks management; oversees the appointment of major project management positions, such as the election of the Tile project leader and deputy. Position held by Larry Price (2009-2011), elected by TileCal Institutes.

- *Publications Committee Member*: The publications committee reviews and approves all papers and preliminary results for ATLAS. Position held by Rik Yoshida (2012-2014), elected by ATLAS.

- *US-ATLAS Tile Calorimeter L2 Manager for Maintenance and Operations*: manages all aspects of tile M&O program (tasks, budgets, priorities). Position held by Larry Price (-2011), Jimmy Proudfoot (2012), appointed by US ATLAS Project Manager.

- *US-ATLAS Tile Calorimeter Upgrade Manager*: manages all aspects of tile calorimeter upgrade program (tasks, budgets, priorities). Position held by Larry Price (-2011), appointed by US ATLAS Project Manager.
- *US-ATLAS Tier3 Coordinato*r: manages all aspects of Tier3 computing systems within US-ATLAS. Position held by Rik Yoshida (2009-2010), appointed by US-ATLAS Project Manager.
- *US-ATLAS Analysis Support Manager*: manages and coordinates physics analysis efforts within US-ATLAS. Position held by Rik Yoshida (Deputy, 2010-2011) and (Manager, 2012-2013), nominated by the US ATLAS Institutional Board and appointed by US-ATLAS Project Manager.

In addition, many members of the group serve on internal editorial boards for ATLAS publications. These are listed in the appendix.

3.8 References

1. Measurement of inclusive jet and dijet cross sections in proton-proton collisions at 7 TeV centre-of-mass energy with the ATLAS detector, The ATLAS Collaboration, The European Physical Journal C - Particles and Fields , Volume 71, Number 2 (2011).
2. Measurements of underlying-event properties using neutral and charged particles in pp collisions at√s = 900 GeV and √s = 7 TeV with the ATLAS detector at the LHC, The ATLAS Collaboration, Eur.Phys.J. C71 (2011) 1636.
3. Measurement of the inclusive isolated prompt photon cross-section in pp collisions at √s=7TeV using 35 pb^{-1} of ATLAS data. The ATLAS Collaboration, Phys. Lett. B Vol 706, (2011).
4. P. Aurenche, et al., Phys. Rev. D 73 (2006) 094007.
5. Study of jets produced in association with a W boson in pp collisions at √s=7 TeV with the ATLAS detector, The ATLAS Collaboration, Phys. Rev. D 85, 092002 (2012).
6. C. F. Berger, Z. Bern, L. J. Dixon, F. Febres Cordero, D. Forde, T. Gleisberg, H. Ita, D. A. Kosower, and D. Maıˆtre,Phys. Rev. Lett. 106, 092001 (2011).
7. Invariant mass distribution of jet pairs produced in association with one lepton and missing transverse energy at the ATLAS experiment, The ATLAS Collaboration, ATLAS-CONF-2011-069.
8. ATLAS measurements of the properties of jets for boosted particle searches, The ATLAS Collaboration, ATLAS-CONF-2012-044.
9. Compressed supersymmetry after 1/fb at the Large Hadron Collider, Thomas J. LeCompte, Stephen P. Martin, Phys.Rev. D85 (2012) 035023.
10. Large Hadron Collider reach for supersymmetric models with compressed mass spectra, Thomas J. LeCompte, Stephen P. Martin, Phys.Rev. D84 (2011) 015004.
11. Measurement of underlying event characteristics using charged particles in pp collisions at √s=900 GeV and 7 TeV with the ATLAS detector, The ATLAS Collaboration, Phys. Rev. D83 (2011) 112001.
12. Offline LVPS trip monitoring. Software implementation / Chekanov, S (ANL); Norberg, S (ANL/University of Oklahoma); Proudfoot, J (ANL), ATL-COM-TILECAL-2011-020.
13. Two Parameter Bendel Model Calculations For Predicting Proton Induced Upset, W.J. Staper et al., IEEE TRANSACTIONS ON NUCLEAR SCIENCE, VOL. 37, NO. 6, (1990).

4. ATLAS- Research Plan: June 2012-June 2015

4.1 Introduction

Following the overall core mission of the ANL HEP division, the strategy of the ANL ATLAS group is to play a leading role in the ATLAS physics program and to enable others within US-ATLAS to do likewise. This is done though participation and leadership in key physics analyses, through providing critical support in hardware maintenance and through the development of unique future capabilities for the experiment. Additionally, we will continue to pursue and enhance our collaborations with others in US-ATLAS. This strategy builds on the successful one developed during 2009-2012. For the coming years we plan to strengthen and expand on this course.

For the next three years, we have defined a set of specific plans that take into account the current set of analyses and upgrade projects being pursued at ANL, the current upgrade plans of the LHC, as well as the likely development in the search for a Standard Model-like Higgs in 2012. The specific plans in these areas are described below. While being specific, they retain the flexibility to be quickly adjusted to the needs depending on new developments and opportunities as dictated by the data.

For each plan area we also outline the current collaborations with other groups as well as opportunities for further collaboration. Through these collaborations the impact of the ANL ATLAS group can increase further without a significant expansion of the group. At the same time, the breadth of analysis and hardware projects made possible by this style of work will provide collaborating institutions with unique opportunities otherwise not available to them.

In the next sections the physics analyses and contributions to the detector operations will be described followed by our plans for the upgrades. The section concludes with a description of the efforts in the area of software and computing and user support.

4.2 Physics Analysis

The ANL ATLAS group has a long history with collider measurements, extending back to CDF and ZEUS. Our analysis activities are guided by two principles. One is the strategy of making solid Standard Model measurements, which can then evolve into searches for Beyond the Standard Model physics that predicts discrepancies between measurements and SM predictions. The second is to enable the analyses of our colleagues within the US by closely collaborating with them. On CDF and ZEUS, our group members performed several QCD measurements involving the production of jets, direct photons and heavy flavor. As we transitioned to ATLAS, we have continued this strategy with our work in jet reconstruction and properties, as well as with direct photon measurements that have led into, and informed, BSM searches involving photons, jets and missing transverse energy. In the next three years, we expect to be active in three main areas: measurements and limits on Higgs couplings; searches involving missing transverse energy; and QCD and other SM measurements, many of which also have a BSM component.

By the end of 2012, the situation with the Higgs boson should become much clearer: either a Standard Model-like Higgs is discovered in the remaining mass window around 125 GeV, or the SM Higgs is found not to be the explanation for EWSB. In either case, the highest priority is to probe the couplings: in the first case to verify (or not) that what we see is in fact the SM Higgs; in the second to look for a non-SM Higgs that might have been missed in the standard search, which assumes SM couplings, or to see what inferences might be drawn from signals smaller than expected in one or more channels. We will study Higgs-couplings by building on our experience in the $\gamma\gamma$, bbbar and ZZ* channels.

Searches involving missing transverse energy build upon our experience with calorimetry, and are usually interpreted in the framework of supersymmetry. We have two areas of activity. One is based on decays that include top and bottom quarks, which tend to be lepton-rich. The other is based on "compressed" spectra – spectra where the mass splittings between states is smaller, often substantially, than in Minimal Supergravity. These models are most sensitive to searches with lepton-free signatures.

ANL has long had an interest in jet measurements and properties. Our early work in jet properties focused on the jet energy scale, and is evolving towards jet substructure and boosted objects. Initially we will continue to study the properties of "ordinary QCD jets", but our long term aim is to study highly boosted top quarks and Higgs bosons. It is worth noting that ATLAS will be deferring the processing of a fraction of the data, including jet triggers, so there will be "fresh" QCD data becoming available in 2013 and 2014.

Most of the analyses we are engaged in are done in close collaborations with our ASC visitors, and US-ATLAS universities. Beyond collaborations with other experimentalists, among those from nearby ATLAS universities with whom we have extensive involvement are theorists Lian-Tao Wang (Chicago) and Stephen Martin (NIU). Both Wang and Martin have been supported by ANL in receiving "short term associations" from the ATLAS collaboration, which provides a mechanism for theorists to gain access to ATLAS data. The compressed SUSY analysis originated at NIU, where there was interest from Martin and Jerry Blazey but not enough people there to carry it forward. In other cases of collaboration, we have provided guidance to graduate students, some of whom are participating at analyses centered at their home institutes and others are participating at analyses centered at ANL. We expect to continue to expand the scope of our analysis involvement by continuing to increase the number of people participating in ATLAS analyses through the Analysis Support Center (ASC).

The ANL ATLAS group has a strong connection to the ATLAS physics program management, and a number of members have held leadership positions. Maintaining this close connection allows us to get students "plugged into" an analysis quickly. Our ties with the rest of the Division and Laboratory, as well as nearby universities and Fermilab provide an environment that students find attractive. We intend to continue to focus on enabling our colleagues to produce more and better science, keeping the flexibility to react to changing conditions and new opportunities.

4.3 Detector Operations

For the remainder of the run in 2012, members of the group will take an appropriate number of tile calorimeter and trigger shifts in the ATLAS Control Room, contribute to data quality validation (a task which will be done at Argonne), and continue to closely monitor the performance of both the new and old power supplies for the Tile Calorimeter. In collaboration with a student ASC visitor from Oklahoma (Norberg), we have developed several scripts to automate performance evaluation and will continue to maintain and where necessary improve upon them.

- We will update the reliability analysis of the power supplies using the additional year of operation and will complete the study of power supply trips associated with single event upsets in the power supply controller chip using the trip data from the prototype and pre-production low voltage power supplies (LVPS). We will use the measured trip rate to set limits on the validity of the phenomenological model which was developed in 2011-12. These data should be sufficient to set limits on the sensitivity of the production LVPS to single event effects over their operational life.

- Pileup has been recognized as a critical factor in Tile Calorimeter energy reconstruction. In collaboration with a student ASC visitor from the University of Wisconsin (Kruse), and staff at SLAC, Northern Illinois University (ASC visitor) and the University of Texas at Arlington we are studying the effect of pileup. We are developing tools to measure the signal waveform and will use these *in situ* waveforms in conjunction with Monte Carlo simulated events with high pileup to realize an improved reconstruction algorithm.

We will continue to provide expert on-call support for the Region of Interest Builder and other TDAQ and Run Manager activities.

In the past three years, we have provided opportunities, which are often authorship qualifying tasks, for ASC visitors (particularly students) to participate in interesting aspects of detector operations in parallel to their analysis activities. In view of the success of these activities, we intend to continue these collaborations for the remainder of the LHC running period in 2012, and to expand them to include other qualification tasks during the shutdown. Detector operation tasks will restart as the new running period approaches towards the end of 2014.

4.4 Tile Calorimeter Replacement Power Supplies (2013-2014)

A key task of the group in the next 3 year period is the completion of the construction of replacement low voltage power supplies, and their installation and commissioning in the shutdown from 2012-2014. At the time of this writing, we have in hand all the transformers (the long lead time item) and about 1400 of the required 2400 (2048+spares) printed circuit boards, with a delivery rate of over 200 per week. At Argonne the supplies are tested, "tuned" (trip settings made uniform) and burned in.

Testing and burn-in stations exist at both ANL and CERN (Figure 12) so that, if necessary, power supplies can be repaired at either location. This set-up allows increased participation from other Tile institutions at both sites. Physicists, engineers and technicians from collaborating institutions will visit ANL to contribute to LVPS testing and repair. We have reached a shipping rate to CERN of up to 92 LVPS units per week. Our planned rate was 80 per week, and to ensure that the last units leave ANL before the end of 2012 requires 68 per week. The present schedule is shown in Figure 13 below:

Figure 12: LVPS test stand at ANL.

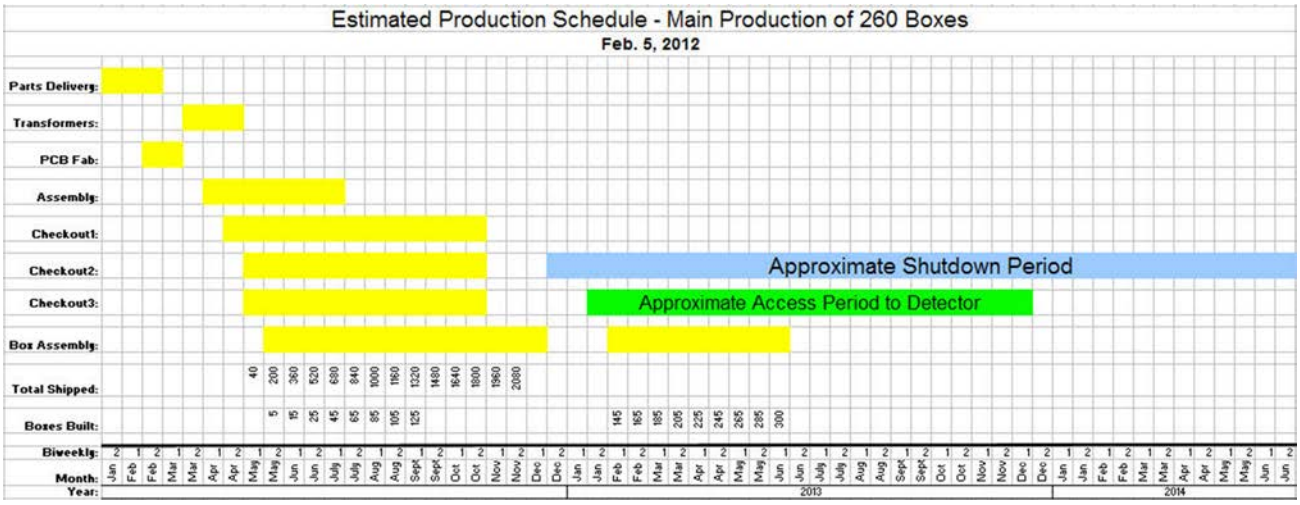

Figure 13: LVPS production schedule.

The first 760 units will be installed immediately after the 2012 run ends, with the remainder to be installed at various times during the shutdown as access to the on-detector electronics becomes available. We expect that this will happen near the end of 2013, but we plan to deliver the full complement at the beginning of the shutdown, so that we are ready in case of schedule changes. Argonne will be involved in this installation, doing both on- and off-detector testing and repairs as necessary.

4.5 Detector Upgrades

Fast TracKer (FTK)

The work will proceed as planned in the FTK project proposal over the next three years. The ANL group will finish a detailed study of electron isolation performance and work together with the ATLAS trigger community to achieve a system-wide strategy for the use of FTK reconstructed tracks in the High Level Trigger. We will continue system design optimization for the FTK with the ATLAS data for the anticipated high levels of pileup, and together with other FTK collaborators, the ANL participants will finish the FTK technical design report (TDR) in 2013. On the hardware side, the ANL group will build a prototype of the FTK-Level 2 Interface Card (FLIC) and develop test utilities. A test stand will be built and used to test the full functionality of the board (see Figure 14). We will also develop the test software kits and the control and monitoring software within the ATLAS framework. A University of Chicago student Ho-ling Li, who is also an ASC visitor, is participating in these activities at ANL. In addition to Chicago, we have close collaborations with Northern Illinois University, with one graduate student and one research scientist resident at Argonne, who are working on the simulation, as well as with the University of Illinois at Urbana-Champaign.

J. Zhang will continue to coordinate the vertical slice integration with the ATLAS experiment and oversee its task progress. We will actively research the technical solutions to the critical issues and assess the hardware performance by analyzing the data taken with other ATLAS detectors.

In collaboration with Fermilab, the ANL group recently started an R&D project of Vertically Integrated Pattern Recognition Associative Memory (VIPRAM). The project aims to significantly increase the Associative Memory (AM) chip capability by using 3D silicon technology. The multi-year VIPRAM project comprises the following critical steps. The first step will strictly be the design of the Content Addressable Memory (CAM) cell and the Control logic laid out in a 2D geometry with 3D functionality. This allows verification of the 3D functionality in two dimensions where access to all components of the chip is possible. The second step will translate the 2D design into 3D and produce a 2-Tier stack prototype with Control layer and CAM layer for initial testing. This prototype will examine the design of the main aspects of a 3D architecture. Following the fabrication of a successful prototype, we will produce a multi-tiered VIPRAM with at least three tiers (one Control layer and two or more CAM layers) to demonstrate the "proof-of-principle". The Detector R&D group at ANL HEP is exploring opportunities for this technology beyond HEP.

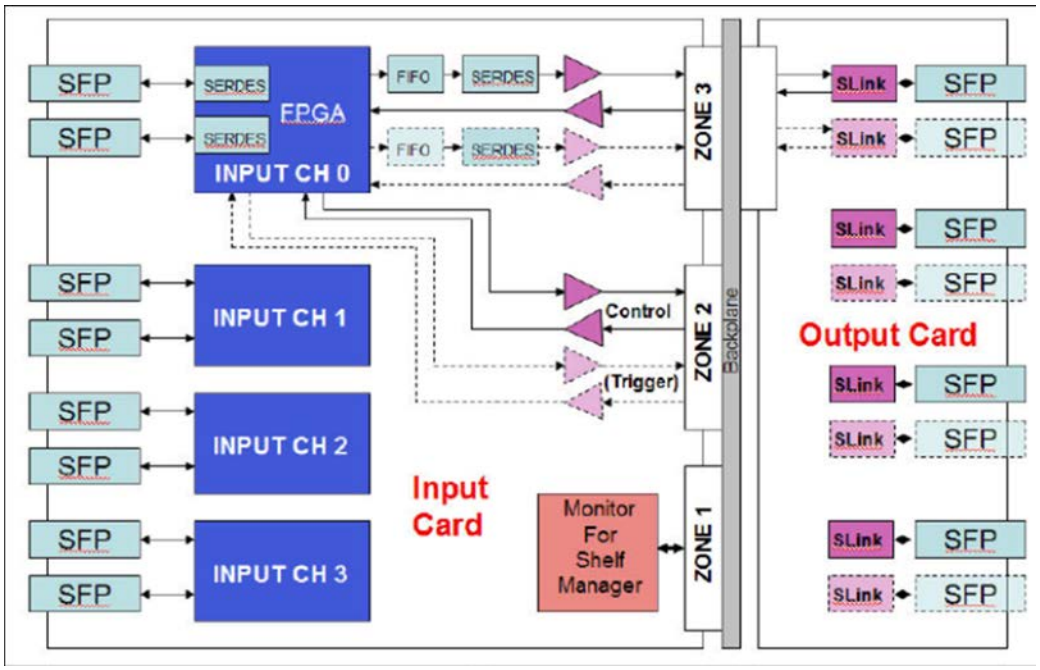

Figure 14: The FTK FLIC currently being designed at Argonne.

4.6 Tile Calorimeter Front-End Electronics and Low Voltage Power Supplies

Members of the group will work with engineers from the ANL-HEP Electronics Group on the design and development of front-end electronics for the full replacement planned for the shutdown around 2022. We have been assigned the task of designing the low voltage power system used to power the tile calorimeter electronics and the PMT high voltage control system. We have proposed that the upgrade use a different front-end readout – the QIE – and will continue to pursue this development until ~2014 when we expect that a technical choice will be made between the three competing approaches. We are also proposing that the drawer electronics use a different and more robust optical link technology, capable of high bandwidth, which was recently identified in the Detector R&D group in the Division – the optical modulator produced by Luxtera.

QIE

ANL will be collaborating with Fermilab to develop a new version of the QIE - a high-performance front-end ASIC for use in high-rate colliding-beam experiments. The research program includes the development, characterization, testing, and radiation certification of the new device. To date, two test devices have been designed and tested. The key feature of this device is that it provides a fast signal reconstruction – the charge integration can be as fast as the intrinsic signal from the calorimeter (the planned shaper stretches the calorimeter signal out over five 25ns bunch crossings).

Our anticipated research program is as follows. In the remainder of 2012 we will test the QIE10C on the bench at ANL. We will design a test board, construct a test stand, and write test and data analysis programs to characterize the device. The board will be designed so that it is capable of interfacing to a photo-multiplier tube. Radiation tests will be an integral part of the research program. Assuming no problems with these two QIE chips, the goal is a submission to MOSIS of a fully-functional QIE design by the end of FY2012. By the latter part of the year, we will perform tests of the new chip with a photo-detector, possibly incorporating tests in a cosmic ray hodoscope at Argonne. Following the completion of the final design of the chip in 2013, we will fabricate 50-100 chips, and prepare for larger scale tests. We will repeat our bench measurements and cosmic ray tests during this period prior to building larger numbers of channels. This will require planning and development of a small readout system to interface to the new chip. Should all tests be successful, and assuming that this approach is still being considered for use in the Tile Calorimeter read out, we will develop in 2014-15 a small system capable of instrumenting ~60 photo-multiplier tubes, test this in the Calibration and Test Facility at CERN, and subsequently perform tests with cosmic rays and in a high energy test beam.

In the data taken in 2011 we have observed significant effects in channels with high occupancy and will use this data in conjunction with simulations to determine the gain in performance realizable through the use of the fast signal reconstruction available with the QIE, which in the case of 50ns bunch spacing (still a possibility) would not be sensitive to out-of-time pileup.

Low Voltage Power Supplies

Argonne has been assigned the task of designing a fully redundant low voltage power supply for the upgraded electronics aimed of 2022. In the next 3 years, we will work on the development of a 3 stage power distribution system, including bulk distribution of high voltage DC, intermediate conversion to 48V, and finally point-of-load regulators at the load. We will also provide expertise with radiation testing of components and subsystems, leveraging our experiences with radiation facilities at Massachusetts General Hospital and the nuclear reactor at Lowell which were used to test LVPS components.

In the remainder of 2012, we will complete the preliminary design of the next-generation low-voltage power supplies. An important aspect of the design is the design of a new transformer. In this period we will construct and build the first switch mode converter prototype. We will perform bench measurements at ANL and will begin the radiation qualification testing of selected parts in the design, using proton, neutron, and gamma irradiation. We will also begin tests with candidate point-of-load regulators. Following the result of the performance and

radiation tests, in 2013, we will produce the design for a second prototype, fabricate it, and repeat our bench and radiation tests. We will select a point-of-load regulator, and begin the design of the full power distribution system.

In 2014 and 2015, we will develop a small system capable of demonstrating the performance of the prototype power distribution system. We will use the developments of the other parts of this research program and incorporate the power system into a complete system test. As is the case for the QIE above, we will aim at system tests in the Calibration and Test Facility at CERN, with cosmic rays, and possibly a test beam. Design iterations may be required based on system performance in prior periods.

Drawer Optical Readout Development Plan

As part of generic R&D into high speed optical link, we identified the commercial Luxtera optical modulator (Figure 15) as a good candidate for further evaluation. It offers, in comparison to the VCSEL based optical links in use at the LHC detectors, significantly higher bandwidth per fiber, lower bit error rate lower by many orders of magnitude, lower power consumption, greater reliability, and lower overall cost. The modulator uses single mode optical fibers, which alone give significant cost reductions over the alternative schemes being considered today. A key issue is radiation tolerance. Initial tests have indicated that the device is close to being acceptable for use in the TileCal, but more studies are needed. Specifically, we have identified a potential problem in the microcontroller used to configure the modulator. There is a similar concern associated with point of load regulators used in the circuit to power the chip. Argonne has recently signed a Non-Disclosure Agreement with Luxtera and will work with the company engineers to understand how to isolate the microcontroller from other components in the circuit in order to better understand the effect of radiation. We plan to identify technical solutions to mitigate this effect by replacing the microcontroller with a radhard FPGA. In the remainder of 2012, we will develop such modifications to the circuit and test the modified device to doses up to those required for radiation qualification in the tile calorimeter (TID to 135 krad, for 10 modified devices using a gamma source, and SEU's for 10 devices).

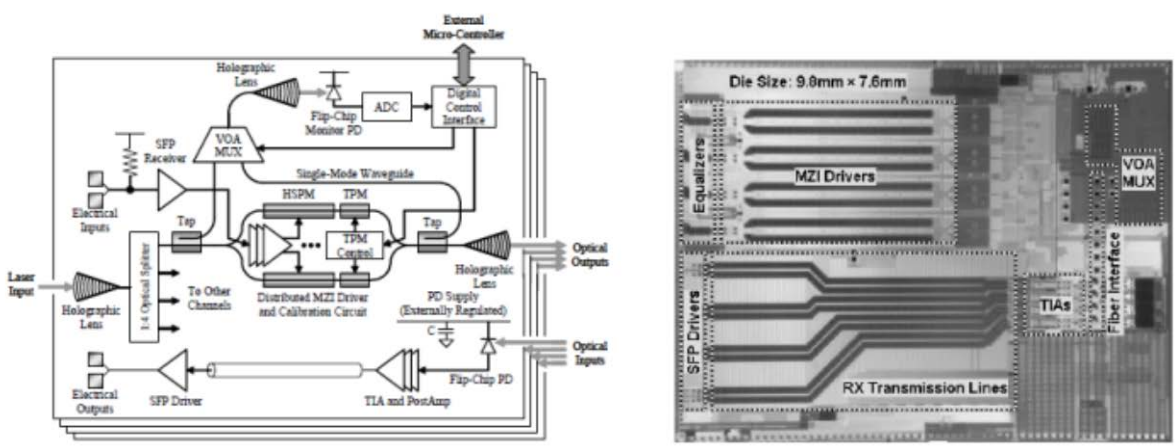

Figure 15: A Luxtera CMOS Silicon-on-Insulator 4x10 Gb/s single chip Optical Modulator. (left) Block diagram, (right), actual device.

Concurrently with the development of a radiation tolerant version of the optical modulator, we will design an interface board to connect the modulator to the proposed upgrade electronics. This will then allow the modulator to be used for the optical link in the drawer demonstrator, which is to be deployed on the detector following the 2013-14 shutdown.

4.7 Evolution of the Region of Interest Builder

In response to concerns that the present VME-based RoIB will approach the end of its useful lifetime, we plan to evaluate options for a future replacement system by either modern hardware or by software (i.e. PC-based) run time assembly of level 1 fragments. As shown in Figure 16, a simple single threaded approach is not adequate to sustain the necessary 100 kHz rate. This figure illustrates the rate in Hz obtained with and without fragment assembly on an Intel Xeon CPU E5345@2.33GHz, with 4 cores. Other tests have been done to illustrate that S-Link input with existing input hardware with no assembly have a similar performance deficit. So far all indications are that a *simple* software approach is not possible despite improvements in computing hardware since the time the RoIB was built. In collaboration with Michigan State University we will explore the possibility of achieving the required level 1 rate in the software-based prototype through the use of multi-threading and I/O optimization. Large scale tests of assembly in the framework of a full ATLAS high level trigger framework will be done at CERN. Smaller scale testing and prototyping is being done at Argonne with the RoIB test stand. If the initial prototype tests demonstrate that a software-based assembly is feasible, a full scale prototype that accommodates more than 8 inputs, including S-Link input, will be built (the level 1 upgrade will add at least one and perhaps more fragments). Once the system is demonstrated to be fully operational it would be moved to CERN for in situ tests at point 1, ultimately with real level 1 inputs. Prototype testing should be completed by June 2013. These tests would involve Argonne personnel, MSU and other ATLAS TDAQ groups.

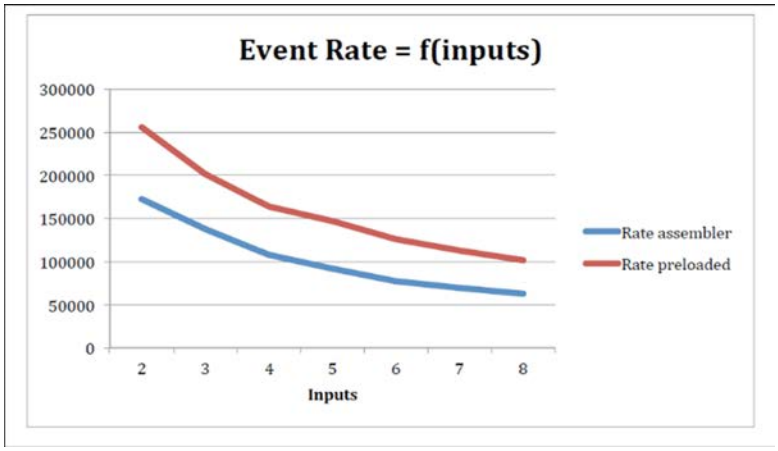

Figure 16: Rate dependence on number of fragments being assembled. The rates for runtime assembly and preloaded with the same payload size are shown.

If we determine that even with modern processors and improved software we cannot attain the necessary 100 kHz level 1 rate, we will evaluate the option of replacing the current system using modern hardware, based on the ATCA architecture being advanced elsewhere in ATLAS TDAQ upgrades. The approach would be to design a prototype ATCA system with a commercial blade that acts as an HLTSV (High Level Trigger SuperVisor) and an RTM (Rear Transition Module) or other custom card(s) that organize the fragments and assembles them in hardware. This work will be based on current FTK FLIC development since the required assembly task is similar to that needed for the RoIB.

4.8 Software and Computing

The efforts of the Argonne core software team will continue to be directed principally toward support of the ATLAS data store and its underlying infrastructure, with particular attention to I/O performance, robustness, and scalability. As part of this effort, the Argonne team will make direct contributions to ROOT I/O software used not only by ATLAS but by most collider physics experiments, with particular attention to the areas of data caching, cache optimization, and instrumentation for I/O performance measurement and tuning. Support for increasingly many-core architectures will be an area of ongoing development. Metadata and supporting infrastructure will continue to be an area of active development, driven by the demands of the increased data volume as well as issues coming from even larger numbers of pileup interactions than in previous years. A migration plan for ATLAS persistence infrastructure beyond the current generation of software known as POOL will be formulated.

The Argonne group's software development efforts are inherently collaborative. An Argonne-developed I/O framework for increasingly-many-core processing is being integrated into the ATLAS execution control framework for which the lead developers are at LBNL. Contributions to ROOT I/O infrastructure are being made in close collaboration with the ROOT I/O effort led by Fermilab. Metadata infrastructure and capabilities are delivered and integrated with metadata components developed in Oxford, Grenoble, and Glasgow. Argonne-developed event selection services are integrated with grid execution capabilities developed by BNL, supported by databases maintained at CERN and at sites around the world, with web services provided by developers in Orsay. Optimization of I/O and persistence infrastructure is undertaken in collaboration with staff at Tier 0, Tier 1, Tier2, and Tier 3 sites that host ATLAS data, so that performance measurement and optimization are understood in the context of real deployment, with examples and use cases provided by members of the ATLAS physics analysis tools team at a range of U.S. and European institutes. Indeed, Argonne has coordination responsibility for effort at institutes around the world in the areas of persistence infrastructure, event storage, I/O framework, and metadata for the ATLAS collaboration.

After an assessment of the performance of I/O and data persistence infrastructure in the 2011 and 2012 runs, we will develop the I/O and persistence infrastructure with which ATLAS will emerge from the long shutdown. A significant number of core software developments and improvements that cannot be deployed without disrupting near-term data taking are scheduled for the long LHC shutdown. Such upgrades will include those needed to keep up with emerging hardware trends (such as many-core chips) and software trends (such as emerging technologies for scientific databases). ATLAS also requires extensions of its current software to support upgrade simulations, which may be additionally stressed by the need to produce very large quantities of pileup samples. For the I/O and data persistence teams, event store support efforts will continue even during the shutdown, and the workload in support of simulation will not be reduced. Work on longer-term software upgrades will continue as appropriate, dependent on the foreseen LHC luminosity and run plan at that time.

In FY 2014, ATLAS will enter a new phase of data taking with its next-generation I/O and persistence infrastructure, with the support requirements that such a transition entails. The more disruptive elements of core software development will have been implemented, and validation of this new code base and its interaction with ATLAS distributed data processing, the infrastructure for which is simultaneously evolving, will be a significant activity. As computing has been recognized as an official part of any Phase II upgrade Letter of Intent, planning and prototyping in support of later upgrades will also be underway.

4.9 Analysis Support Center

The ANL ASC is central to the planning of the ANL ATLAS group. The environment offered by the ASC to its visitors are now, and will continue to be, the most important element in attracting collaborators not only for analysis, but for a wide variety of ATLAS projects being planned as outlined in the preceding sections.

In the next three years, we plan to continue with our model of building collaborations around the capabilities of ANL ASC. From the rate of growth in the last years, we estimate that the number of long-term visitors will increase by 20-30% in the next three years. The available infrastructure at ANL ASC, including office space as well as secretarial and technical support, should be sufficient to accommodate such an increase. An expansion beyond this, however, will likely require increased resources for the ANL ASC.

Physics Analyses

The main mission of the ASC is to act as a focal point of analyses for US ATLAS institutes. Almost all of the scientific research achievements listed in Section 3.2 were undertaken in collaboration with long-term visitors to the ASC as described. The same holds for the analysis plans described Section 4.2; we have plans to collaborate with visitors on all of the subjects discussed.

In its first period, 2006-2009, ANL ASC was a center based primarily on serving US ATLAS through pedagogical jamborees held rather often (up to once every two months just before data taking) where 20-40 people at a time were introduced to the ATLAS analysis environment. In the last three years, ANL ASC has

become a center where long-term visitors work with ANL staff and postdocs on analyses for mutual benefit, as described in the accomplishment section of this report. Increasingly, ASC acts as a contact point between ANL and US ATLAS Universities for, not only analyses, but for detector operation and upgrade activities. We plan to build on these connections in the coming three years.

Meetings and Jamborees

We plan to hold US ATLAS Physics jamborees or related meetings at the ASC at the pace of once or twice a year for the next three years. We plan to involve many outside groups in the organization of these meetings as opportunities arise. In the recent past, we have worked together with the ANL HEP Theory group, Fermilab LPC, and DESY Analysis Support Center. We will continue to provide a good video conference infrastructure so that remote participation in these events is useful (see Figure 17).

Figure 17: A physics jamboree on boosted objects held at ANL ASC in October 2011 with the participation of the ANL Theory group. About half of the attendance is via video conferencing.

ANL ASC and Tier3 computing

At the end of 2010, Yoshida's term as US ATLAS Tier3 coordinator ended. D. Benjamin (an ASC visitor) was appointed US-ATLAS Tier3 coordinator. The management and coordination of US ATLAS Tier3s are handled by the US ATLAS operations. ANL ATLAS group is committed to providing the US ATLAS T3 coordinator with an appropriate test cluster equipment and support, and cooperation for maintenance and development of US ATLAS Tier3s.

Figure 18: ANL ASC Tier3 cluster in the ALCF building.

Locally, ANL ASC will continue to offer its long-term visitors and collaborators the use of the ANL ASC Tier3 cluster. The current system was built in 2010 and consists of ~100 TB storage and 240 cores for processing. The cluster is in the process of being moved to the computer room in the Argonne Leadership Computing Facility (ALCF) to take advantage of their infrastructure (Figure 18). We estimate that the current computing capacity is well matched to the needs of the ANL ATLAS group and the ASC visitors through the analysis of 2012 data. In early 2013, we will re-evaluate the local computing resources. In the future we need to adopt a rolling replacement policy where older and energy-inefficient hardware is replaced on a scheduled basis.

Long-term visitors

In the next three years, we plan the analyses collaborations at the ASC to continue at least at the current level but also expect to enter a new phase where collaboration with universities in areas other than analysis becomes of equal importance.

As already discussed in the above sections, the students visiting ASC normally participate in at least one technical activity in addition to analysis activities. The activities are chosen to benefit both the students and the technical project. These projects, so far, have been mostly on detector operations. However, we are beginning to see participation to upgrade projects, such as those on FTK, by visiting students. Several long-term visitors from NIU, staff and a student, are also taking advantage of the analysis collaboration opportunities at ASC as well as close cooperation on the work on FTK.

We expect to offer many opportunities for ATLAS technical work that is attractive particularly to students, who also wish to make progress on ATLAS analyses using the resources of the ANL ASC. Many of these opportunities will arise from the projects and plans described in the preceding sections. We are also exploring ways to work together with the Detector R&D group to create more such opportunities.

Recently, ANL ASC has agreed to host a student from Duke University, who will work with Benjamin (Duke), also a long-term visitor at ANL ASC, on firmware development for upgrade tracker readout. Thus far, ANL ATLAS group has no direct connection to this project; however, we are exploring possibilities for collaboration together with the Detector R & D group in the division. This demonstrates the ability of ANL ASC to offer support both in terms of analysis opportunities and technical facilities that is attractive to universities.

The current and planned visitors for the near future are listed below:

US ATLAS ASC Fellowships

The ASC Fellows act as leaders at the ASC. They are a part of US Analysis Support Panel and organize the US ATLAS physics meetings as well as the local ANL ASC physics Jamborees. The current fellows at ANL are:

- Adam Yurkewicz (Northern Illinois University)
- Chunhui Chen (Iowa State University)

These fellowships, lasting 6 months to a year, are funded by DOE through US ATLAS operations. We plan to integrate the future recipients of the fellowship to the ANL ASC in a similar way.

Visiting Faculty/Staff

We currently host the following University faculty and staff members at the ASC and plan to continue to do so for the near future:

- Doug Benjamin (Duke University, 2008-)
- Dhiman Chakraborty (Northern Illinois University, 2008-)
- Al Goshaw (Duke University, 2011-)
- Bo Jayatilaka (Duke University, 2012-)
- Guilherme Lima (Northern Illinois University, 2008-)
- Vishnu Zutshi (Northern Illinois University, 2008-)

Undergraduate Summer Students

We plan to continue to support about three SULI summer students every year. The students for 2012 and their mentors are:

- Joshua Loyal: Sergei Chekanov and Ben Auerbach (postdoc)
- Zack Schut: Duong Ngyugen (postdoc)
- Lucas Mastalli-Kelly: Lily Asquith (postdoc)
- Jack Weinstein: Peter van Gemmeren

Graduate Student Fellows

We plan to, contingent on availability of funds, continue to support about three graduate student fellowships at the ASC. The current fellows and their research projects are:

- Ho-Ling Li (Chicago): FTK, W' and boosted top
- Daniel Pluth (Iowa State University): Boosted top
- Chen Zhou (Duke): Tracker Readout firmware development+ SUSY trileptons

Additional Student Visitors

We will continue to host students who wish to work at the ASC. The students who are at the ASC currently and will be for the near future are:

- Chad Suhr (NIU)
- Robert Calkins (NIU)
- Blake Burghgrave (NIU)
- Meg Shea (Duke)

Most students who spent time at the ASC prior to their time at CERN wish to return to the ASC while they further their analysis and complete their thesis. This was the case with the current visitors Suhr and Calkins and the former visitor Brian Martin (MSU). The 2011 Graduate Fellows Scarlet Norberg (OU) and Amanda Kruse (Wisconsin) have expressed wishes to return to the ASC after their time at CERN.

5. APPENDIX A: Full Publication List

ATLAS Publications

1. Search for same-sign top-quark production and fourth-generation down-type quarks in pp collisions at √s = 7 TeV with the ATLAS detector
   By ATLAS Collaboration (Georges Aad et al.). arXiv:1202.5520 [hep-ex]. JHEP 1204 (2012) 069.

2. Search for anomaly-mediated supersymmetry breaking with the ATLAS detector based on a disappearing-track signature in pp collisions at √s = 7 TeV
   By ATLAS Collaboration (Georges Aad et al.). arXiv:1202.4847 [hep-ex]. Eur.Phys.J. C72 (2012) 1993.

3. Search for the Standard Model Higgs boson in the decay channel H->ZZ(*)->4l with 4.8 fb^{-1} of pp collision data at √s = 7 TeV with ATLAS
   By ATLAS Collaboration (Georges Aad et al.). arXiv:1202.1415 [hep-ex]. Phys.Lett. B710 (2012) 383-402.

4. Search for the Standard Model Higgs boson in the diphoton decay channel with 4.9 fb^{-1} of pp collisions at √s = 7 TeV with ATLAS
   By ATLAS Collaboration (Georges Aad et al.). arXiv:1202.1414 [hep-ex]. Phys.Rev.Lett. 108 (2012) 111803.

5. Combined search for the Standard Model Higgs boson using up to 4.9 fb^{-1} of pp collision data at √s = 7 TeV with the ATLAS detector at the LHC
   By ATLAS Collaboration (Georges Aad et al.). arXiv:1202.1408 [hep-ex]. Phys.Lett. B710 (2012) 49-66.

6. Search for decays of stopped, long-lived particles from 7 TeV pp collisions with the ATLAS detector
   By ATLAS Collaboration (Georges Aad et al.). arXiv:1201.5595 [hep-ex]. Eur.Phys.J. C72 (2012) 1965.

7. Search for excited leptons in proton-proton collisions at √s = 7 TeV with the ATLAS detector
   By ATLAS Collaboration (Georges Aad et al.). arXiv:1201.3293 [hep-ex]. Phys.Rev. D85 (2012) 072003.

8. Rapidity gap cross sections measured with the ATLAS detector in pp collisions at √s = 7 TeV
   By ATLAS Collaboration (Georges Aad et al.). arXiv:1201.2808 [hep-ex]. Eur.Phys.J. C72 (2012) 1926.

9. Measurement of the top quark pair production cross-section with ATLAS in the single lepton channel
   By ATLAS Collaboration (Georges Aad et al.) arXiv:1201.1889 [hep-ex]. Phys.Lett. B711 (2012) 244-263.

10. Study of jets produced in association with a W boson in pp collisions at √s = 7 TeV with the ATLAS detector
    By ATLAS Collaboration (Georges Aad et al.). arXiv:1201.1276 [hep-ex]. Phys.Rev. D85 (2012) 092002.

11. Search for anomalous production of prompt like-sign muon pairs and constraints on physics beyond the Standard Model with the ATLAS detector
    By ATLAS Collaboration (Georges Aad et al.). arXiv:1201.1091 [hep-ex]. Phys.Rev. D88 (2012) 032004.

12. Search for first generation scalar leptoquarks in pp collisions at √s = 7 TeV with the ATLAS detector
    By ATLAS Collaboration (Georges Aad et al.). arXiv:1112.4828 [hep-ex]. Phys.Lett. B709 (2012) 158-176, Erratum-ibid. 711 (2012) 442-455.

13. Measurement of $D^{*+/-}$ meson production in jets from pp collisions at √s = 7 TeV with the ATLAS detector
    By ATLAS Collaboration (Georges Aad et al.). arXiv:1112.4432 [hep-ex]. Phys.Rev. D85 (2012) 052005.

14. Search for scalar bottom pair production with the ATLAS detector in pp Collisions at √s = 7 TeV
    By ATLAS Collaboration (Georges Aad et al.). arXiv:1112.3832 [hep-ex]. Phys.Rev.Lett. 108 (2012) 181802.

15. Search for the Higgs boson in the H->WW(*)->lvlv decay channel in pp collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1112.2577 [hep-ex]. Phys.Rev.Lett. 108 (2012) 111802.

16. Search for Extra Dimensions using diphoton events in 7 TeV proton-proton collisions with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1112.2194 [hep-ex]. Phys.Lett. B710 (2012) 538-556.

17. Measurement of the WZ production cross section and limits on anomalous triple gauge couplings in proton-proton collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1111.5570 [hep-ex]. Phys.Lett. B709 (2012) 341-357.

18. Search for Diphoton Events with Large Missing Transverse Momentum in 1 fb^{-1} of 7 TeV Proton-Proton Collision Data with the ATLAS Detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1111.4116 [hep-ex]. Phys.Lett. B710 (2012) 519-537.

19. Measurement of the production cross section for Z/gamma* in association with jets in pp collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1111.2690 [hep-ex]. Phys.Rev. D85 (2012) 032009.

20. Kshort and Lambda production in pp interactions at √s = 0.9 and 7 TeV measured with the ATLAS detector at the LHC
By ATLAS Collaboration (Georges Aad et al.). arXiv:1111.1297 [hep-ex]. Phys.Rev. D85 (2012) 012001.

21. Search for strong gravity signatures in same-sign dimuon final states using the ATLAS detector at the LHC
By ATLAS Collaboration (Georges Aad et al.). arXiv:1111.0080 [hep-ex]. Phys.Lett. B709 (2012) 322-340.

22. A study of the material in the ATLAS inner detector using secondary hadronic interactions
By ATLAS Collaboration (Georges Aad et al.). arXiv:1110.6191 [hep-ex]. JINST 7 (2012) P01013.

23. Searches for supersymmetry with the ATLAS detector using final states with two leptons and missing transverse momentum in √s = 7 TeV proton-proton collisions
By ATLAS Collaboration (Georges Aad et al.). arXiv:1110.6189 [hep-ex]. Phys.Lett. B709 (2012) 137-157.

24. Measurement of the ZZ production cross section and limits on anomalous neutral triple gauge couplings in proton-proton collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1110.5016 [hep-ex]. Phys.Rev.Lett. 108 (2012) 041804.

25. Electron performance measurements with the ATLAS detector using the 2010 LHC proton-proton collision data
By ATLAS Collaboration (Georges Aad et al.). arXiv:1110.3174 [hep-ex]. Eur.Phys.J. C72 (2012) 1909.

26. Search for Massive Colored Scalars in Four-Jet Final States in √s = 7 TeV proton-proton collisions with the ATLAS Detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1110.2693 [hep-ex]. Eur.Phys.J. C71 (2011) 1828.

27. Search for new phenomena in final states with large jet multiplicities and missing transverse momentum using √s = 7 TeV pp collisions with the ATLAS detector
By Atlas Collaboration (Georges Aad et al.). arXiv:1110.2299 [hep-ex]. JHEP 1111 (2011) 099.

28. Performance of the ATLAS Trigger System in 2010
By Atlas Collaboration (Georges Aad et al.). arXiv:1110.1530 [hep-ex]. Eur.Phys.J. C72 (2012) 1849.

29. Measurement of the inclusive and dijet cross-sections of b-jets in pp collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1109.6833 [hep-ex]. Eur.Phys.J. C71 (2011) 1846.

30. Search for supersymmetry in final states with jets, missing transverse momentum and one isolated lepton in √s = 7 TeV pp collisions using 1 fb^{-1} of ATLAS data
By ATLAS Collaboration (Georges Aad et al.). arXiv:1109.6606 [hep-ex]. Phys.Rev. D85 (2012) 012006.

31. Search for squarks and gluinos using final states with jets and missing transverse momentum with the ATLAS detector in √s = 7 TeV proton-proton collisions
By ATLAS Collaboration (Georges Aad et al.). arXiv:1109.6572 [hep-ex]. Phys.Lett. B710 (2012) 67-85.

32. Search for the Standard Model Higgs boson in the decay channel H->ZZ(*)->4l with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1109.5945 [hep-ex]. Phys.Lett. B705 (2011) 435-451.

33. Measurement of the jet fragmentation function and transverse profile in proton-proton collisions at a center-of-mass energy of 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1109.5816 [hep-ex]. Eur.Phys.J. C71 (2011) 1795.

34. Measurement of the inclusive W+- and Z/gamma cross sections in the electron and muon decay channels in pp collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1109.5141 [hep-ex]. Phys.Rev. D85 (2012) 072004.

35. Search for New Phenomena in ttbar Events With Large Missing Transverse Momentum in Proton-Proton Collisions at √s = 7 TeV with the ATLAS Detector
By ATLAS Collaboration (Georges Aad et al.) arXiv:1109.4725 [hep-ex] Phys.Rev.Lett. 108 (2012) 041805.

36. Search for the Higgs boson in the H -> WW -> lvjj decay channel in pp collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1109.3615 [hep-ex]. Phys.Rev.Lett. 107 (2011) 231801.

37. Search for a Standard Model Higgs boson in the $H -> ZZ -> $\lambda^+\lambda^-\nu\nu$ decay channel with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1109.3357 [hep-ex]. Phys.Rev.Lett. 107 (2011) 221802.

38. Search for a heavy neutral particle decaying into an electron and a muon using 1 fb^-1 of ATLAS data
By ATLAS Collaboration (Georges Aad et al.). arXiv:1109.3089 [hep-ex]. Eur.Phys.J. C71 (2011) 1809.

39. Search for displaced vertices arising from decays of new heavy particles in 7 TeV pp collisions at ATLAS
By ATLAS Collaboration (Georges Aad et al.). arXiv:1109.2242 [hep-ex]. Phys.Lett. B707 (2012) 478-496.

40. Measurement of the cross-section for b-jets produced in association with a Z boson at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1109.1403 [hep-ex]. Phys.Lett. B706 (2012) 295-313.

41. Measurement of the cross section for the production of a W boson in association with b-jets in pp collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1109.1470 [hep-ex]. Phys.Lett. B707 (2012) 418-437.

42. Measurements of the electron and muon inclusive cross-sections in proton-proton collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1109.0525 [hep-ex]. Phys.Lett. B707 (2012) 438-458.

43. Search for New Physics in the Dijet Mass Distribution using 1 fb^-1 of pp Collision Data at √s = 7 TeV collected by the ATLAS Detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.6311 [hep-ex]. Phys.Lett. B708 (2012) 37-54.

44. Measurement of the Transverse Momentum Distribution of W Bosons in pp Collisions at √s = 7 TeV with the ATLAS Detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.6308 [hep-ex]. Phys.Rev. D85 (2012) 012005.

45. Measurement of the centrality dependence of the charged particle pseudorapidity distribution in lead-lead collisions at √s_NN = 2.76 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.6027 [hep-ex]. Phys.Lett. B710 (2012) 363-382.

46. Measurement of the pseudorapidity and transverse momentum dependence of the elliptic flow of charged particles in lead-lead collisions at √s_NN = 2.76 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.6018 [hep-ex]. Phys.Lett. B707 (2012) 330-348.

47. Search for the Standard Model Higgs boson in the two photon decay channel with the ATLAS detector at the LHC
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.5895 [hep-ex]. Phys.Lett. B705 (2011) 452-470.

48. Performance of Missing Transverse Momentum Reconstruction in Proton-Proton Collisions at 7 TeV with ATLAS
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.5602 [hep-ex]. Eur.Phys.J. C72 (2012) 1844.

49. Search for a heavy Standard Model Higgs boson in the channel H->ZZ->llqq using the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.5064 [hep-ex]. Phys.Lett. B707 (2012) 27-45.

50. A measurement of the ratio of the W and Z cross sections with exactly one associated jet in pp collisions at √s = 7 TeV with ATLAS
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.4908 [hep-ex]. Phys.Lett. B708 (2012) 221-240.

51. Measurement of the W to tau nu Cross Section in pp Collisions at √s = 7 TeV with the ATLAS experiment
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.4101 [hep-ex]. Phys.Lett. B706 (2012) 276-294.

52. Measurement of the top quark pair production cross section in pp collisions at √s = 7 TeV in dilepton final states with ATLAS
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.3699 [hep-ex]. Phys.Lett. B707 (2012) 459-477.

53. Measurement of the Z to tau tau Cross Section with the ATLAS Detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.2016 [hep-ex]. Phys.Rev. D84 (2011) 112006.

54. Search for dilepton resonances in pp collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.1582 [hep-ex]. Phys.Rev.Lett. 107 (2011) 272002.

55. Search for a heavy gauge boson decaying to a charged lepton and a neutrino in 1 fb-1 of pp collisions at √s = 7 TeV using the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.1316 [hep-ex]. Phys.Lett. B705 (2011) 28-46.

56. Inclusive search for same-sign dilepton signatures in pp collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.0366 [hep-ex]. JHEP 1110 (2011) 107.

57. Measurement of the inclusive isolated prompt photon cross-section in pp collisions at √s = 7 TeV using 35 pb-1 of ATLAS data
By ATLAS Collaboration (Georges Aad et al.). arXiv:1108.0253 [hep-ex]. Phys.Lett. B706 (2011) 150-167.

58. Search for neutral MSSM Higgs bosons decaying to $\tilde{\tau}$ pairs in proton-proton collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1107.5003 [hep-ex]. Phys.Lett. B705 (2011) 174-192.

59. Properties of jets measured from tracks in proton-proton collisions at center-of-mass energy √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1107.3311 [hep-ex]. Phys.Rev. D84 (2011) 054001.

60. Measurement of the transverse momentum distribution of Z/gamma* bosons in proton-proton collisions at sqrt(s)=7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1107.2381 [hep-ex]. Phys.Lett. B705 (2011) 415-434.

61. Measurement of multi-jet cross sections in proton-proton collisions at a 7 TeV center-of-mass energy
By ATLAS Collaboration (Georges Aad et al.). arXiv:1107.2092 [hep-ex]. Eur.Phys.J. C71 (2011) 1763.

62. Measurement of dijet production with a veto on additional central jet activity in pp collisions at sqrt(s)=7 TeV using the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1107.1641 [hep-ex]. JHEP 1109 (2011) 053.

63. Search for Diphoton Events with Large Missing Transverse Energy with 36 pb^{-1} of 7 TeV Proton-Proton Collision Data with the ATLAS Detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1107.0561 [hep-ex]. Eur.Phys.J. C71 (2011) 1744.

64. Measurement of the isolated di-photon cross-section in pp collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1107.0581 [hep-ex]. Phys.Rev. D85 (2012) 012003.

65. Measurement of the Upsilon(1S) Production Cross-Section in pp Collisions at √s = 7 TeV in ATLAS
By ATLAS Collaboration (Georges Aad et al.). arXiv:1106.5325 [hep-ex]. Phys.Lett. B705 (2011) 9-27.

66. Search for new phenomena with the monojet and missing transverse momentum signature using the ATLAS detector in √s = 7 TeV proton-proton collisions
By ATLAS Collaboration (Georges Aad et al.). arXiv:1106.5327 [hep-ex]. Phys.Lett. B705 (2011) 294-312.

67. Search for Heavy Long-Lived Charged Particles with the ATLAS detector in pp collisions at √s = 7 TeV
By ATLAS Collaboration (Georges Aad et al.). arXiv:1106.4495 [hep-ex]. Phys.Lett. B703 (2011) 428-446.

68. Limits on the production of the Standard Model Higgs Boson in pp collisions at √s =7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1106.2748 [hep-ex]. Eur.Phys.J. C71 (2011) 1728.

69. Measurement of Wgamma and Zgamma production in proton-proton collisions at √s = 7 TeV with the ATLAS Detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1106.1592 [hep-ex]. JHEP 1109 (2011) 072.

70. Measurement of the WW cross section in √s = 7 TeV pp collisions with ATLAS
By ATLAS Collaboration (Georges Aad et al.). arXiv:1104.5225 [hep-ex]. Phys.Rev.Lett. 107 (2011) 041802.

71. Search for Contact Interactions in Dimuon Events from pp Collisions at √s = 7 TeV with the ATLAS Detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1104.4398 [hep-ex]. Phys.Rev. D84 (2011) 011101.

72. Search for pair production of first or second generation leptoquarks in proton-proton collisions at √s = 7 TeV using the ATLAS detector at the LHC
By ATLAS Collaboration (Georges Aad et al.). arXiv:1104.4481 [hep-ex]. Phys.Rev. D83 (2011) 112006.

73. Search for an excess of events with an identical flavour lepton pair and significant missing transverse momentum in √s = 7 TeV proton-proton collisions with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1103.6208 [hep-ex]. Eur.Phys.J. C71 (2011) 1647.

74. Search for supersymmetric particles in events with lepton pairs and large missing transverse momentum in √s = 7 TeV proton-proton collisions with the ATLAS experiment
By ATLAS Collaboration (Georges Aad et al.). arXiv:1103.6214 [hep-ex]. Eur.Phys.J. C71 (2011) 1682.

75. Search for high mass dilepton resonances in pp collisions at $\sqrt{s}=7$ TeV with the ATLAS experiment
By ATLAS Collaboration (Georges Aad et al.). arXiv:1103.6218 [hep-ex]. Phys.Lett. B700 (2011) 163-180.

76. Search for a heavy particle decaying into an electron and a muon with the ATLAS detector in √s = 7 TeV pp collisions at the LHC
By ATLAS Collaboration (Georges Aad et al.). arXiv:1103.5559 [hep-ex]. Phys.Rev.Lett. 106 (2011) 251801.

77. Search for supersymmetry in pp collisions at √s = 7TeV in final states with missing transverse momentum and b-jets
By ATLAS Collaboration (Georges Aad et al.). arXiv:1103.4344 [hep-ex]. Phys.Lett. B701 (2011) 398-416.

78. Measurement of the Muon Charge Asymmetry from W Bosons Produced in pp Collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1103.2929 [hep-ex]. Phys.Lett. B701 (2011) 31-49.

79. Search for stable hadronising squarks and gluinos with the ATLAS experiment at the LHC
By ATLAS Collaboration (Georges Aad et al.). arXiv:1103.1984 [hep-ex]. Phys.Lett. B701 (2011) 1-19.

80. Measurements of underlying-event properties using neutral and charged particles in pp collisions at 900 GeV and 7 TeV with the ATLAS detector at the LHC
By ATLAS Collaboration (Georges Aad et al.). arXiv:1103.1816 [hep-ex]. Eur.Phys.J. C71 (2011) 1636.

81. Search for high-mass states with one lepton plus missing transverse momentum in proton-proton collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1103.1391 [hep-ex]. Phys.Lett. B701 (2011) 50-69.

82. Search for squarks and gluinos using final states with jets and missing transverse momentum with the ATLAS detector in √s = 7 TeV proton-proton collisions
By Atlas Collaboration (Georges Aad et al.). arXiv:1102.5290 [hep-ex]. Phys.Lett. B701 (2011) 186-203.

83. Measurement of Dijet Azimuthal Decorrelations in pp Collisions at √s = 7 TeV
By ATLAS Collaboration (Georges Aad et al.). arXiv:1102.2696 [hep-ex]. Phys.Rev.Lett. 106 (2011) 172002.

84. Search for supersymmetry using final states with one lepton, jets, and missing transverse momentum with the ATLAS detector in √s = 7 TeV pp
By Atlas Collaboration (Georges Aad et al.). arXiv:1102.2357 [hep-ex]. Phys.Rev.Lett. 106 (2011) 131802.

85. Search for Massive Long-lived Highly Ionising Particles with the ATLAS Detector at the LHC
By ATLAS Collaboration (Georges Aad et al.). arXiv:1102.0459 [hep-ex]. Phys.Lett. B698 (2011) 353-370.

86. Luminosity Determination in pp Collisions at √s = 7 TeV Using the ATLAS Detector at the LHC
By ATLAS Collaboration (Georges Aad et al.). arXiv:1101.2185 [hep-ex]. Eur.Phys.J. C71 (2011) 1630.

87. Study of Jet Shapes in Inclusive Jet Production in pp Collisions at √s = 7 TeV using the ATLAS Detector
By Atlas Collaboration (G. Aad et al.). arXiv:1101.0070 [hep-ex]. Phys.Rev. D83 (2011) 052003.

88. Measurement of the production cross section for W-bosons in association with jets in pp collisions at √s = 7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1012.5382 [hep-ex]. Phys.Lett. B698 (2011) 325-345.

89. Measurement of the centrality dependence of J/ψ yields and observation of Z production in lead-lead collisions with the ATLAS detector at the LHC
By Atlas Collaboration (G. Aad et al.). arXiv:1012.5419 [hep-ex]. Phys.Lett. B697 (2011) 294-312.

90. Measurement of the inclusive isolated prompt photon cross section in pp collisions at √s = 7 TeV with the ATLAS detector
By Atlas Collaboration (G. Aad et al.). arXiv:1012.4389 [hep-ex]. Phys.Rev. D83 (2011) 052005.

91. Search for Diphoton Events with Large Missing Transverse Energy in 7 TeV Proton-Proton Collisions with the ATLAS Detector
By ATLAS Collaboration (Georges Aad et al.). arXiv:1012.4272 [hep-ex]. Phys.Rev.Lett. 106 (2011) 121803.

92. Measurement of the top quark-pair production cross section with ATLAS in pp collisions at √s = 7 TeV
By Atlas Collaboration (Georges Aad et al.). arXiv:1012.1792 [hep-ex]. Eur.Phys.J. C71 (2011) 1577.

93. Measurement of underlying event characteristics using charged particles in pp collisions at √s = 900 GeV and 7 TeV with the ATLAS detector
By Atlas Collaboration (Georges Aad et al.). arXiv:1012.0791 [hep-ex]. Phys.Rev. D83 (2011) 112001.

94. Observation of a Centrality-Dependent Dijet Asymmetry in Lead-Lead Collisions at √s _NN = 2.76 TeV with the ATLAS Detector at the LHC
By Atlas Collaboration (Georges Aad et al.). arXiv:1011.6182 [hep-ex]. Phys.Rev.Lett. 105 (2010) 252303.

95. Studies of the performance of the ATLAS detector using cosmic-ray muons
By The ATLAS Collaboration (G. Aad et al.). arXiv:1011.6665 [physics.ins-det]. Eur.Phys.J. C71 (2011) 1593.

96. Study of energy response and resolution of the ATLAS barrel calorimeter to hadrons of energies from 20-GeV to 350-GeV
By ATLAS Collaboration (E. Abat et al.). Nucl.Instrum.Meth. A621 (2010) 134-150.

97. Measurement of the W -> lν and Z/gamma* -> λλ production cross sections in proton-proton collisions at √s = 7 TeV with the ATLAS detector
By Atlas Collaboration (G. Aad et al.). arXiv:1010.2130 [hep-ex]. JHEP 1012 (2010) 060.

98. Search for Quark Contact Interactions in Dijet Angular Distributions in pp Collisions at √ = 7 TeV Measured with the ATLAS Detector
By ATLAS Collaboration (G. Aad et al.). arXiv:1009.5069 [hep-ex]. Phys.Lett. B694 (2011) 327-345.

99. Measurement of inclusive jet and dijet cross sections in proton-proton collisions at 7 TeV centre-of-mass energy with the ATLAS detector
By Atlas Collaboration (G. Aad et al.). arXiv:1009.5908 [hep-ex]. Eur.Phys.J. C71 (2011) 1512.

100. Search for New Particles in Two-Jet Final States in 7 TeV Proton-Proton Collisions with the ATLAS Detector at the LHC
By ATLAS Collaboration (G. Aad et al.). arXiv:1008.2461 [hep-ex]. Phys.Rev.Lett. 105 (2010) 161801.

101. Readiness of the ATLAS Tile Calorimeter for LHC collisions
By ATLAS Collaboration (G. Aad et al.). arXiv:1007.5423 [physics.ins-det]. Eur.Phys.J. C70 (2010) 1193-1236.

102. Performance of the ATLAS Detector using First Collision Data
By Atlas Collaboration (G. Aad et al.). arXiv:1005.5254 [hep-ex]. JHEP 1009 (2010) 056.

103. Charged-particle multiplicities in pp interactions at $\sqrt{s}$ = 900 GeV measured with the ATLAS detector at the LHC
By ATLAS Collaboration (G. Aad et al.). arXiv:1003.3124 [hep-ex]. Phys.Lett. B688 (2010) 21-42.

Non-ATLAS Publications

104. Compressed supersymmetry after 1/fb at the Large Hadron Collider, Thomas J. LeCompte, Stephen P. Martin, Phys.Rev. D85 (2012) 035023

105. Large Hadron Collider reach for supersymmetric models with compressed mass spectra, Thomas J. LeCompte, Stephen P. Martin, Phys.Rev. D84 (2011) 015004

106. Jet Substructure at the Tevatron and LHC: New results, new tools, new benchmarks, A. Altheimer et al. e-Print: arXiv:1201.0008

107. Experimental summary of ISMD10, S.Proceedings of the Proceedings of the XL International Symposium on Multiparticle Dynamics (ISMD10, 21-25 September 2010, University of Antwerp, Belgium), Chekanov, S, ANL-HEP-CP-10-66, E-print: arxiv.org:1012.1195

108. New approach for jet-shape identification of TeV-scale particles at the LHC. S. Chekanov, C. Levy, J. Proudfoot, R. Yoshida, Phys.Rev. D82 (2010) 094029

6. APPENDIX B: Conferences

Conferences

1. R. Blair, “Signature based searches for new physics involving photons at the Tevatron",PoS ICHEP2010:383,2010
2. L. Asquith, "Nonstandard jets with ATLAS”, Boost 2011, 23rd May 2011, Princeton, NJ
3. L. Asquith, "ATLAS- the greatest show on earth", Engaged Scholar Series, 12th October 2011, Michigan State
4. L. Asquith, New jet physics with ATLAS , APS annual meeting, 2nd April 2012, Atlanta, GA
5. S. Chekanov, A summary talk given during 40th edition of the International Symposium on Multiparticle Dynamics (ISMD10), 21-25 September 2010 University of Antwerp (Belgium)
6. S. Chekanov, Tests of the Standard Model with the ATLAS detector at the LHC
   Invited talk at the Cracow Epiphany Conference, Jan 10-13, 2011 (Krakow, Poland)
7. S. Chekanov, T3g as an example for Tier3 for USA ATLAS. US ATLAS Distributed Facilities Meeting, OSG all hands meeting in Livingston, LA (LIGO laboratory), March 2-4, 2009
8. A. Vaniachine, Advancements in Big Data Processing (Invited Talk), July 16-21, 2012, International Conference Distributed Computing and Grid-technologies in Science and Education (Grid'2012) , JINR, Dubna, Russia
9. A. Vaniachine, ATLAS Distributed Computing Operations: Experience and improvements after 2 full years of data-taking May 21-25, 2012, International Conference on Computing in High Energy and Nuclear Physics (CHEP 2012), New York City, NY
10. A. Vaniachine, ATLAS Grid Data Processing: system evolution and scalability, May 21-25, 2012. International Conference on Computing in High Energy and Nuclear Physics (CHEP 2012), New York City, NY
11. A. Vaniachine, ATLAS Detector Data Processing on the Grid, October 23-29, 2011, 2011 IEEE Nuclear Science Symposium, Valencia, Spain
12. A. Vaniachine, ATLAS Petascale Data Processing on the Grid: Facilitating Physics Discoveries at the LHC, August 8-13, 2011 2011 Meeting of the Division of Particles and Fields of American Physical Society, Brown University, Providence, RI
13. A. Vaniachine, Processing the ATLAS Detector Data on the Grid, October 18-22, 2010, International Conference on Computing in High Energy and Nuclear Physics, Taipei, Taiwan
14. A. Vaniachine, Scaling up ATLAS Database Release Technology for the LHC Long Run, October 18-22, 2010, International Conference on Computing in High Energy and Nuclear Physics, Taipei, Taiwan
15. A. Vaniachine, LHC Databases on the Grid: Achievements and Open Issues (Invited Talk) June 28 - July 3, 2010, IV International Conference "Distributed Computing and Grid-technologies in Science and Education" (Grid2010), JINR, Dubna, Russia
16. A. Vaniachine, Databases in LHC Experiments: Usage and Lessons Learned (Invited Talk)
    March 9-12, 2010, SuperB Computing R&D Workshop, IUSS, Ferrara, Italy
17. A. Vaniachine, Scalable Database Access Technologies for ATLAS Distributed Computing, July 26-31, 2009, DPF2009 Meeting, Wayne State University, Detroit, MI
18. A. Vaniachine, Knowledge Management System for ATLAS Scalable Task Processing on the Grid, March 21-27, 2009, International Conference on Computing in High Energy and Nuclear Physics (CHEP’09), Prague, Czech Republic.

19. A. Vaniachine, Petaminer: Using ROOT for Efficient Data Storage in MySQL Database March 21-27, 2009. International Conference on Computing in High Energy and Nuclear Physics (ICHEP'09), Prague, Czech Republic.

20. A. Vaniachine, Advanced Technologies for Scalable ATLAS Conditions Database Access on the Grid, March 21-27, 2009, International Conference on Computing in High Energy and Nuclear Physics (CHEP'09), Prague, Czech Republic,

21. A. Vaniachine, Reprocessing LHC beam and cosmic ray data with the ATLAS distributed Production System, March 21-27, 2009, International Conference on Computing in High Energy and Nuclear Physics (CHEP'09), Prague, Czech Republic,

22. A. Vaniachine, COOL Performance Optimization and Scalability Tests, March 21-27, 2009 International Conference on Computing in High Energy and Nuclear Physics (CHEP'09), Prague, Czech Republic,

23. J. Proudfoot , Soft QCD Measurements at 900 GeV and 7TeV with ATLAS, 15th International QCD Conference 28th June - 3rd July 2010 Montpellier, France

24. J. Proudfoot , A Glimpse of the ATLAS Experiment at the Large Hadron Collider, Fermilab visit by Swiss Consulate in Chicago, March 2010

25. T .LeCompte, Berkeley Workshop on LHC Physics, LBL May 9 2009 "ATLAS Trigger Strategies and Early Physics Perspectives"

26. T. LeCompte, AAAS 20 February 2011 Washington DC "Is There Something Smaller Than Quarks?", 23rd Rencontres de Blois 30 May 2011, Blois France "QCD At Hadron Colliders"

27. T. LeCompte, Physics opportunities with LHC at 7 TeV, KEK, Feb 14-19, "Compressed Supersymmetry" , Chicago 2012 Workshop on LHC Physics, 2 May 2012 "QCD analyses for MC tuning and interesting observable"

28. A. Paramonov, "Background Rejection Techniques in Measurements with Jets", Chicago 2012 workshop on LHC Physics, May 2012

29. A. Paramonov, "W/Z + jets and W/Z + heavy flavor production at the LHC", 47th Rencontres de , Moriond on QCD and High Energy Interactions, La Thuile, Italy, March 2012

30. A. Paramonov, "Invariant mass distribution of jet pairs produced in association with one lepton and missing transverse energy at the ATLAS experiment", Implications at the LHC of BSM interpretations of CDF's ttbar forward-backward asymmetry and Wjj anomaly, LHC Physics Center at CERN, May 2011

31. A. Paramonov, "Measurement of W/Z-boson production in association with jets at ATLAS", Plenary talk at the Conference on LHC First Data, Ann Arbor (MI, USA), December 2010

32. A> Paramonov, "Limitations on the predictions for pT-balance in events with a Z-boson and jets", Presentation at PHENO 2010

33. A. Paramonov, "Limitations on the predictions for pT-balance in events with a Z-boson and jets", Presentation at DIS 2010, Florence (Italy) "Search for the Neutral Current Top Quark Decay t→Zc", Poster at Hadron Collider Physics Symposium 2009, Evian (France)

34. B. Maria Salvachua Ferrando, PisaJet11 @ Pisa Italy: New Physics with Jets, March, 2011

35. R. Yoshida, "HERA results on small-x and diffraction": Workshop at Univ. of Washington, Institute for Nuclear Theory, September 2010, Seattle

36. R. Yoshida, CHEP-2010 Poster contribution: "Design and Performance of Tier3 Computing Facility Based on Virtual Machine Technology." D. Benjamin, J. Blomer, P.Buncic, H. Kagan, S.Y. Patinkin, Y.Yao, and R. Yoshida

37. R. Yoshida, “Combined Measurements of NC and CC DIS Cross-Sections at HERA” PANIC 2011, Cambridge, MA, 25 July, 2011

38. R. Yoshida, “Gamma Gamma and Z Gamma channels” Next Stretch of the Higgs Magnificent Mile Workshop”, Chicago 14-16 May, 2012

39. R. Yoshida, “Search for the Higgs boson in the diphoton decay channel with 4.9 fb^{-1} of ATLAS data at \sqrt{s} = 7 TeV” CIPANP2012, St. Petersburg FL, 29 May - 3 June, 2012

40. J. Zhang, “ATLAS update on UE results”, LPCC Minimum Bias and Underlying Event Working Group Meeting, CERN, February 8, 2011

41. J. Zhang, “Results from ATLAS”, XIX International Workshop on Deep-Inelastic Scattering and Related Subjects, Newport News, VA, April 11, 2011

42. J. Zhang, “Enhancement of the ATLAS Trigger System with a Hardware Tracker Finder FTK”, Topical Workshop on Electronics for Particle Physics 2010, Aachen, Germany, September 23, 2010

43. J. Zhang, “ATLAS Data Acquisition”, IEEE NPSS Real Time Conference 2009, Beijing, China, May 14, 2009

44. Peter Van Gemmeren, "Persistent Data Layout and Infrastructure for Efficient Selective Retrieval of Event Data in ATLAS", presented at Meeting of the Division of Particles and Fields of the American Physical Society 2011, eprint arXiv:1109.3119

45. Peter Van Gemmeren, "Supporting high-performance I/O at the petascale: The event data store for ATLAS at the LHC", IEEE International Conference on Cluster Computing and Workshops 2010, pp.1-7, 20-24 Sept. 2010, doi: 10.1109/CLUSTERWKSP.2010.5613100

46. Peter Van Gemmeren, "The event data store and I/O framework for the ATLAS experiment at the Large Hadron Collider", IEEE International Conference on Cluster Computing and Workshops 2009, pp.1-8, Aug. 31 2009-Sept. 4 2009, doi: 10.1109/CLUSTR.2009.5289147.

47. D. Malon, J. Cranshaw, P. van Gemmeren, Q. Zhang (Argonne), Emerging database technologies and their applicability to high energy physics: A first look at SciDB., 18th International Conference on Computing in High Energy and Nuclear Physics (CHEP 2010),
18-22 Oct 2010: Taipei, Taiwan

48. M. Mambelli (Chicago U.), J. Cranshaw (Argonne), R. Gardner (Chicago U.), T. Maeno (Brookhaven), D. Malon (Argonne), M. Novak (Brookhaven), Job optimization in ATLAS TAG-based distributed analysis, 17th International Conference on Computing in High Energy and Nuclear Physics (CHEP 09), 21-27 Mar 2009: Prague, Czech Republic, HEP records: C09-03-21

49. F. Viegas (CERN), D. Malon, J. Cranshaw (Argonne), G. Dimitrov (DESY), M. Nowak (Brookhaven), A. Nairz, L. Goossens (CERN), E. Gallas (Oxford U.), C. Gamboa (Brookhaven), A. Wong (TRIUMF) et al.The ATLAS TAGS database distribution and management: Operational challenges of a multi-terabyte distributed database.17th International Conference on Computing in High Energy and Nuclear Physics (CHEP 09) 21-27 Mar 2009: Prague, Czech Republic, HEP records: C09-03-21

50. J. Cranshaw, D. Malon, A. Vaniachine (Argonne), V. Fine, J. Lauret (Brookhaven), P. Hamill (Tech-X, Boulder), Petaminer: Using ROOT for efficient data storage in MySQL database.17th International Conference on Computing in High Energy and Nuclear Physics (CHEP 09), 21-27 Mar 2009: Prague, Czech Republic, HEP records: C09-03-21

7. APPENDIX C: ATLAS Internal Notes

ATLAS Notes

PHYSICS

1. Search for squarks and gluinos using final states with jets and missing transverse momentum with the ATLAS experiment in sqrt(s) = 7 TeV proton-proton collisions: supporting documentation / Asai, S; Ask, S; Baak, M; Barr, A J; Besjes, G; Bruneliere, R; Caron, S ;; Chavez Baraja, C; Consorti, V; Cote, D et al. ATL-COM-PHYS-2012-426. - Geneva: CERN, 2012

2. Performance of large-R jets and jet substructure reconstruction with the ATLAS detector / Asquith, L; Chapleau, B; Davison, A; Kasieczka, G; Miller, D W; Reisin, H; Schaetzel, S; Swiatlowski, M; Thompson, E N ATL-COM-PHYS-2012-415. - Geneva: CERN, 2012

3. ATLAS measurements of the properties of jets for boosted particle searches / Alon, R et al. ATL-COM-PHYS-2012-364. - Geneva: CERN, 2012 - 22 p.

4. ATLAS measurements of the global properties of jets for boosted particle searches / Alon, R et al. ATL-COM-PHYS-2012-291. - Geneva: CERN, 2012 - 12 p.

5. Measurements of the characteristics of high pT jets in pp collisions at sqrt(s) = 7 TeV with the ATLAS detector. / Alon, R et al. ATL-COM-PHYS-2012-232. - Geneva: CERN, 2012 - 14 p.

6. W/Z + jets and W/Z + heavy flavor production at the LHC / Paramonov, AA (Argonne National Laboratory)
ATL-COM-PHYS-2012-220. - Geneva: CERN, 2012

7. Studies of highly boosted top quarks at the TeV scale in pp collisions at sqrts=7 TeV : Internal supporting material / Auerbach, B; Benjamin, D; Blair, B; Chekanov, S; Chen, C; De Lorenzi, F; Golling, T; Ruiz Martinez, A; Kvita, J; Proudfoot, J et al.
ATL-COM-PHYS-2012-144. - Geneva: CERN, 2012 - 80 p.

8. Studies of high-pT jets in terms of the presence of highly boosted TeV-scale top quarks in pp collisions at 7 TeV / Auerbach, B (ANL); Chekanov, S (ANL)
ATL-COM-PHYS-2012-074. - Geneva: CERN, 2012 - 14 p.

9. Search for the Standard Model Higgs Boson in the ZH->nunubb Channel with the ATLAS Detector at the LHC / Ahmadov, F; Alio, L; Allbrooke, B M M; Asquith, L; Bhimji, W; Bieniek, S; Butterworth, J M; Casadei, D; Cheplakov, A; Christidi, I et al.
ATL-COM-PHYS-2012-062. - Geneva: CERN, 2012

10. Datasets for Compressed SUSY Grid Points / LeCompte, T; Martin, S; Nguyen, D
ATL-COM-PHYS-2012-046. - Geneva: CERN, 2012 - 21 p.

11. Search for squarks and gluinos using final states with jets and missing transverse momentum with the ATLAS experiment in sqrt(s) = 7 TeV proton-proton collisions: supporting documentation / Asai, S; Ask, S; Baak, M; Barr, A J; Bruneliere, R; Caron, S; Chavez Baraja, C; Consorti, V; Cote, D; Dietrich, J et al. ATL-COM-PHYS-2011-1736. - Geneva: CERN, 2011

12. Search for the Higgs boson in the WH->lnubb and ZH->llbb channels in ATLAS using 5fb-1 of LHC collision data / Ahmadov, F; Alio, L; Allbrooke, BMM; Asquith, L; Bhimji, W; Bieniek, S; Butterworth, JM; Cheplakov, A; Christidi, I; Clark, PJ et al.

13. Pileup Corrections for Mass and Shapes of Boosted Jets in ATLAS / Alon, R (Weizmann Institute of Science, Rehovot, Israel); Asquith, L (Argonne National Laboratory, IL, USA); Chekanov, S (Argonne National Laboratory, IL, USA); Duchovni, E (Weizmann Institute of Science, Rehovot, Israel); Farooque, T (University of Toronto, Toronto, Canada); Sinervo, P K (University of Toronto, Toronto, Canada)
ATL-COM-PHYS-2011-1662. - Geneva: CERN, 2011 - 41 p.

14. Jet mass and substructure of inclusive jets in √s = 7 TeV pp collisions with the ATLAS experiment / Alon, R; Asquith, L; Baker, S; Bergeaas Kuutmann, E; Chapleau, B; Chekanov, S; Davison, A R; Duchovni, E; Farooque, T; Ferrando, J et al.
ATL-COM-PHYS-2011-1598. - Geneva: CERN, 2011

15. Evidence for boosted top quarks beyond the TeV scale in pp collisions at 7 TeV / Chekanov, S (ANL); Proudfoot, J (ANL); Yoshida, R (ANL)
ATL-COM-PHYS-2011-1597. - Geneva: CERN, 2011 - 14 p.

16. Measurement of the production cross section of an isolated photon associated with jets in pp collisions at s √ =7 TeV with the ATLAS detector / Cantero, J et al.
ATL-COM-PHYS-2011-1498. - Geneva: CERN, 2011

17. Backup Note for Jet Mass and Substructure in QCD Jets with the ATLAS Experiment / Alon, R; Asquith, L; Baker, S; Bergeaas Kuutmann, E; Chapleau, B; Chekanov, S; Davison, A R; Duchovni, E; Farooque, T; Ferrando, J et al.
ATL-COM-PHYS-2011-1319. - Geneva: CERN, 2011

18. Observation of boosted Z bosons in pp collisions at sqrt(s)= 7 TeV with the ATLAS detector / Asquith, L (ANL); Chekanov, S (ANL); Proudfoot, J (ANL); Yoshida, R (ANL)
ATL-COM-PHYS-2011-1240. - Geneva: CERN, 2011 - 15 p.

19. Estimation of dijet backgrounds to Z→μμ decay with the matrix method and in situ determination of muon identification efficiency and jet to muon fake rate / Marchetti, L; Paramonov, A
ATL-COM-PHYS-2011-1031. - Geneva: CERN, 2011

20. Measurements of the characteristics of boosted, massive jets in pp collisions at 7 TeV with the ATLAS detector. / Alon, R et al.
ATL-COM-PHYS-2011-1014. - Geneva: CERN, 2011 - 33 p.

21. Measurement of the isolated photon plus jet cross section in pp collisions at sqrt(s) = 7 TeV with the ATLAS detector / Cantero, J et al.
ATL-COM-PHYS-2011-870. - Geneva: CERN, 2011

22. Further search for squarks and gluinos using final states with jets and missing transverse momentum with the ATLAS experiment in √s = 7 TeV proton-proton collisions: supporting documentation / Asai, S; Ask, S; Baak, M; Barr, A J; Bruneliere, R; Caron, S; Chavez Baraja, C; Consorti, V; Cote, D; Dietrich, J et al.
ATL-COM-PHYS-2011-784. - Geneva: CERN, 2011

23. Measurement of the cross section for jets produced in association with a W -boson in pp collisions at s √ = 7 TeV / Arabidze, G; Berglund, E; Bruneliere, R; Calfayan, P; Consonni, M; Devetak, E; Dunford, M; Fiascaris, M; Hara, K; Hayashi, T et al.
ATL-COM-PHYS-2011-769. - Geneva: CERN, 2011

24. Measurement of inclusive jet and dijet production in pp collisions at s √ =7 TeV using the ATLAS detector / Baker, S et al.
ATL-COM-PHYS-2011-738. - Geneva: CERN, 2011

25. Searches for new physics with jets in ATLAS / Salvachua, B (ANL)
ATL-COM-PHYS-2011-672. - Geneva: CERN, 2011 - 8 p.

26. QCD at Hadron Colliders / LeCompte, T
An overview of QCD at Hadron Colliders presented at the 23rd Rencontres de Blois. (Blois, France)
ATL-COM-PHYS-2011-660. - Geneva: CERN, 2011

27. Measurement of the inclusive isolated prompt photon cross section in pp collisions at s √ = 7 TeV with the ATLAS detector using 35 pb −1 / Abreu, H; Brelier, B; Bucci, F; Carminati, L; Chekanov, S; Daya, R; Delmastro, M; Dova, MT; Fanti, M; Fayard, L et al.
ATL-COM-PHYS-2011-645. - Geneva: CERN, 2011 - 50 p.

28. Search for squarks and gluinos using final states with jets and missing transverse momentum with the ATLAS experiment in sqrt(s) = 7 TeV proton-proton collisions: supporting documentation / Asai, S; Ask, S; Baak, M; Barr, A J; Bruneliere, R; Caron, S; Chavez Barajas, C; Consorti, V; Cote, D; Duflot, L et al.
ATL-COM-PHYS-2011-510. - Geneva: CERN, 2011 - 127 p.

29. Measuring non-standard jets with ATLAS / Asquith, L (Argonne National Laboratory)
ATL-COM-PHYS-2011-490. - Geneva: CERN, 2011 - 19 p.

30. Measurement of Jet Mass and Substructure in QCD with the ATLAS Experiment / Alon, R; Asquith, L; Baker, S; Bergeaas Kuutmann, E; Chapleau, B; Chekanov, S; Davison, A R; Duchovni, E; Farooque, T; Ferrando, J et al.
ATL-COM-PHYS-2011-449. - Geneva: CERN, 2011

31. Backup Note for Measurement of Jet Mass and Substructure in QCD with the ATLAS Experiment / Alon, R; Asquith, L; Baker, S; Bergeaas Kuutmann, E; Chapleau, B; Chekanov, S; Davison, A R; Duchovni, E; Farooque, T; Ferrando, J et al.
ATL-COM-PHYS-2011-401. - Geneva: CERN, 2011

32. Supporting Document: Invariant mass distribution of jet pairs produced in association with one lepton and missing transverse energy at the ATLAS experiment / Abi, B; Bierwagen, K; Caputo, R; Deluca, C; DeWilde, B; Gray, H; Jen-La Plante, I; Khanov, A; Ma, L; Martin, B et al.
ATL-COM-PHYS-2011-396. - Geneva: CERN, 2011 - 16 p.

33. Search for new physics with jets in ATLAS / Salvachua, B (ANL)
ATL-COM-PHYS-2011-386. - Geneva: CERN, 2011 - 22 p.

34. Results from ATLAS / Zhang, J (Argonne National Laboratory)
ATL-COM-PHYS-2011-332. - Geneva: CERN, 2011

35. New ATLAS event generator tunes to 2010 data / Buckley, A G et al.
ATL-COM-PHYS-2011-329. - Geneva: CERN, 2011 - 33 p.

36. Measurement of the cross-section for jets produced in association with a W -boson in pp collisions at s √ = 7 TeV / Arabidze, G; Berglund, E; Bruneliere, R; Calfayan, P; Devetak, E; Dunford, M; Fiascaris, M; Hara, K; Hayashi, T; Hobbs, J et al.
ATL-COM-PHYS-2011-280. - Geneva: CERN, 2011

37. Precision tests of the Standard Model using the ATLAS detector at the LHC / Chekanov, S (ANL)
This article discusses the recent tests of the Standard Model using pp collision events collected with the ATLAS detector at Large Hadron Collider (LHC) during 2010 data taking period. The paper focuses on measurements of hard and soft sectors of quantum chromodynamics (QCD), a theory describing interactions of quarks and gluons.
ATL-COM-PHYS-2011-279; ANL-HEP-CP-11-19. - Geneva: CERN, 2011 - 11 p.

38. Measurement of the inclusive isolated prompt photon cross section in pp collisions at s √ = 7 TeV with the ATLAS detector using 35 pb −1 / Abreu, H; Brelier, B; Bucci, F; Carminati, L; Chekanov, S; Daya, R; Delmastro, M; Dova, M T; Fanti, M; Fayard, L et al.
ATL-COM-PHYS-2011-239. - Geneva: CERN, 2011 - 42 p.

39. Measurement of inclusive jet and dijet cross sections in proton-proton collision data at 7 TeV centre-of-mass energy using the ATLAS detector / Baker, S et al.
ATL-COM-PHYS-2011-216. - Geneva: CERN, 2011 - 46 p.

40. Measurement of the cross section for jets produced in association with Z bosons / Bauchemin, H; Berglund, E; Bierwagen, K; Blumenschein, U; Buchanan, J; Calfayan, P; Costin, T; De Vivie, J B; Grinstein, S; Grivaz, J F et al.
ATL-COM-PHYS-2011-141. - Geneva: CERN, 2011

41. Measurement of inclusive jet and dijet cross sections in proton-proton collisions at 7 TeV centre-of-mass energy with the ATLAS detector (Supporting Documentation) / Baker, S et al.
ATL-COM-PHYS-2011-140. - Geneva: CERN, 2011

42. Measurement of underlying event characteristics using charged particles in pp collisions at sqrt{s} =900 GeV and 7 TeV with the ATLAS detector in a limited phase space / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATL-COM-PHYS-2011-062. - Geneva: CERN, 2011

43. Measurement of underlying event characteristics using charged particles in pp collisions at sqrt{s} =900 GeV and 7 TeV with the ATLAS detector in a limited phase space / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATL-COM-PHYS-2011-061. - Geneva: CERN, 2011

44. Measurements of underlying event properties using calorimeter clusters in pp collisions at 900 GeV and 7 TeV with the ATLAS detector at the LHC / Bertella, C; Buckley, A; Chekanov, S; Giovaninni, P; Hare, G; Kanaya, N; Kar, D; Menke, S; Nielsen, J; Proudfoot, J et al.
ATL-COM-PHYS-2011-022. - Geneva: CERN, 2011 - 15 p.

45. Standard Model Results from the ATLAS Experiment / Chekanov, S (ANL), Presented at the Cracow Epiphany Conference (10-12 January, 2011)
ATL-COM-PHYS-2010-1072. - Geneva: CERN, 2010 - 30 p.

46. ATLAS Global Cell Weighting Jet Calibration for MC09 Atlfast II / Salvachua, B; Eckweiler, S; Vivarelli,I
ATL-COM-PHYS-2010-1055. - Geneva: CERN, 2010 - 12 p.

47. Measurement of W/Z-boson production in association with jets at ATLAS / Paramonov, A
Presentation or the recent Atlas results at Conference on LHC First Data at Ann Arbor, December 12-14, 2010.
ATL-COM-PHYS-2010-1008. - Geneva: CERN, 2010 - 14 p.

48. Measurement of W/Z-boson production in association with jets at ATLAS / Paramonov, A
Presentation or the recent Atlas results at Conference on LHC First Data at Ann Arbor, December 12-14, 2010.
ATL-COM-PHYS-2010-1008. - Geneva: CERN, 2010 - 14 p.

49. Searches for a Higgs boson decaying to a b-quark pair with the ATLAS detector at the LHC / Ahmadov, F et al.
ATL-COM-PHYS-2010-929. - Geneva: CERN, 2010

50. Supporting plots for "Measurement of the production cross section for W -bosons in association with jets in pp collisions at sqrts=7 TeV with the ATLAS detector" / Ahmad, A; Beauchemin, P; Berglund, E; Bierwagen, K; Blumenschein, U; Boveia, A; Borroni, S; Bruneliere, R; Calfayan, P; Deluca, C et al.
ATL-COM-PHYS-2010-977. - Geneva: CERN, 2010 - 6 p.

51. Measurement of the cross-section for jets produced in association with a Z-boson in pp collisions at sqrt(s) = 7 TeV / Bauchemin, H; Berglund, E; Bierwagen, K; Blumenschein, U; Borroni, S; Brandt, G; Bruneliere, R; Buchanan, J; Calfayan, P; Carrillo-Montoya, G et al.
ATL-COM-PHYS-2010-884. - Geneva: CERN, 2010

52. Measurement of the production cross section for W-bosons in association with jets in pp collisions at sqrts = 7 TeV with the ATLAS detector / Ahmad, A; Beauchemin, P-H; Berglund, E; Bierwagen, K; Blumenschein, U; Boveia, A; Borroni, S; Bruneliere, R; Calfayan, P; Deluca, C et al.
ATL-COM-PHYS-2010-883. - Geneva: CERN, 2010 - 18 p.

53. Additional plots for leading charged particle underlying event measurements in pp collisions at sqrt{s} = 900 GeV and 7 TeV with the ATLAS Detector at the LHC / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATL-COM-PHYS-2010-869. - Geneva: CERN, 2010

54. Update: Track-based underlying event measurements in pp collisions at sqrt(s) = 900 GeV and 7 TeV with the ATLAS Detector at the LHC / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATL-COM-PHYS-2010-822. - Geneva: CERN, 2010

55. Measurement of inclusive jet and dijet cross sections in proton-proton collisions at 7 TeV centre-of-mass energy with the ATLAS detector / Baker, S; Begel, M; Boelaert, N; Butterworth, J; Buckingham, R; Campanelli, M; Carli, T; Cavasinni, V; Choudalakis, G; Demirkoz, B et al.
ATL-COM-PHYS-2010-819. - Geneva: CERN, 2010 - 92 p.

56. Theoretical Predictions for Measurements of the Inclusive Isolated Photon Cross Section in pp Collisions at s √=7\TeV / Blair, B (HEP Division, Argonne National Laboratory, 9700 S. Cass, Argonne, IL 60439,USA); Bucci, F (DPNC, Universit\'{e} de Gen\`{e}ve); Chekanov, S (HEP Division, Argonne National Laboratory, 9700 S. Cass, Argonne, IL 60439,USA); Stockton, M (CERN, CH-1211 Geneva 23, Switzerland); Tripiana, M (Universidad Nacional de La Plata (UNLP))
ATL-COM-PHYS-2010-805. - Geneva: CERN, 2010

57. Measurement of the inclusive isolated prompt photon cross section in pp collisions at sqrts=7TeV with the ATLAS detector / Abreu, H; Andari, N; Becot, C; Blair, R; Bucci, F; Carminati, L; Chekanov, S; Dao, V; Daya, R K; Delmastro, M et al.
ATL-COM-PHYS-2010-802. - Geneva: CERN, 2010

58. Additional plots for track-based underlying event measurement / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATL-COM-PHYS-2010-792. - Geneva: CERN, 2010

59. New approach for jet-shape identification of TeV-scale particles at the LHC / Chekanov, S; Levy, C; Proudfoot, J; Yoshida, R
ATL-COM-PHYS-2010-783; ANL-HEP-PR-10-47. - Geneva: CERN, 2010 - 15 p

60. Muon selection requirements for measurements of W-boson production in association with jets / Martin, B; Paramonov, A
ATL-COM-PHYS-2010-757. - Geneva: CERN, 2010 - 17 p.

61. Measurement of the cross-section for jets produced in association with a W-boson in pp collisions at sqrt(s) = 7 TeV / Ahmad, A; Beauchemin, P; Berglund, E; Bierwagen, K; Blumenschein, U; Boveia, A; Borroni, S; Bruneliere, R; Calfayan, P; Deluca, C et al.
ATL-COM-PHYS-2010-756. - Geneva: CERN, 2010 - 68 p.

62. Track-based underlying event measurements in pp collisions at sqrt{s} = 900 GeV and 7 TeV with the ATLAS Detector at the LHC / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATL-COM-PHYS-2010-666. - Geneva: CERN, 2010

63. Soft QCD Measurements at 900 GeV and 7 TeV with ATLAS / Proudfoot, J
ATL-COM-PHYS-2010-604. - Geneva: CERN, 2010 - 4 p.

64. Track-based underlying event measurements in pp collisions at sqrt{s} = 900 GeV and 7 TeV with the ATLAS Detector at the LHC / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATL-COM-PHYS-2010-567. - Geneva: CERN, 2010

65. Studies of particle flow using calorimeter clusters in pp collisions at 900 Gave and 7 TV with the ATLAS detector at the LHC / Bert Ella, C; Buckley, A; Chekanov, S; Giovanni, P; Hare, G A; Anaya, N; Kara, D; Menken, S; Nielsen, J; Proudfoot, J et al.
ATL-COM-PHYS-2010-440. - Geneva: CERN, 2010 - 19 p.

66. Measurement of jet production in 7 TeV proton-proton collision with the ATLAS detector / Baker, S; Begel, M; Boelaert, N; Butterworth, J; Buckingham, R; Campanelli, M; Carli, T; Cavasinni, V; Choudalakis, G; Demirkoz, B et al.
ATL-COM-PHYS-2010-407. - Geneva: CERN, 2010

67. Soft QCD Measurements at 900 GeV and 7 TeV with ATLAS / Proudfoot, J
ATL-COM-PHYS-2010-376. - Geneva: CERN, 2010

68. pi0 Mass with Topological Calorimeter Clusters in ATLAS Data at 900 GeV and 7 TeV / Chekanov, S (Argonne National Laboratory); Proudfoot, J (Argonne National Laboratory); Zhang, J (Argonne National Laboratory)
ATL-COM-PHYS-2010-351. - Geneva: CERN, 2010

69. Alternative cell energy density jet calibration strategy for the ATLAS detector / Salvachua, B (Argonne National Laboratory); Fullana, E (Argonne National Laboratory)
ATL-COM-PHYS-2010-304. - Geneva: CERN, 2010 - 11 p.

70. Underlying event particle flow based on calorimeter clusters in pp collisions at 7 TeV with the ATLAS detector at the LHC / Bertella, C; Chekanov, S; Giovaninni, P; Kanaya, N; Menke, S; Proudfoot, J; Roda, C; Starovoitov, P; Vivarelli, I; Yoshida, R et al.
ATL-COM-PHYS-2010-293. - Geneva: CERN, 2010 - 37 p.

71. Track-based underlying event measurements in pp collisions at sqrt{s} = 7 TeV with the ATLAS Detector at the LHC / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATL-COM-PHYS-2010-237. - Geneva: CERN, 2010

72. Underlying event particle flow based on calorimeter clusters in pp collisions at 900 GeV with the ATLAS detector at the LHC / Bertella, C; Chekanov, S; Giovaninni, P; Kanaya, N; Menke, S; Proudfoot, J; Roda, C; Starovoitov, P; Vivarelli, I; Yoshida, R et al.
ATL-COM-PHYS-2010-210. - Geneva: CERN, 2010 - 30 p.

73. Track-based underlying event measurements in pp collisions at sqrt{s} = 900 GeV with the ATLAS Detector at the LHC / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATL-COM-PHYS-2010-175. - Geneva: CERN, 2010

74. Using bin-by-bin corrections for track-based underlying event measurements in pp collisions at 900 GeV / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Yoshida, R; Wahrmund, S
ATL-COM-PHYS-2010-165. - Geneva: CERN, 2010 - 17 p.

75. Track-based underlying event measurements in pp collisions at sqrt{s} = 900 GeV with the ATLAS Detector at the LHC / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATL-COM-PHYS-2010-164. - Geneva: CERN, 2010

76. Searches for TeV-scale particles at the LHC using jet substructure / Chekanov, S (ANL); Proudfoot, J (ANL)
ATL-COM-PHYS-2010-035; ANL-HEP-PR-10-2. - Geneva: CERN, 2010 - 13 p.

77. Performance of Jet Algorithms in the ATLAS Detector / Asquith, L; Brelier, B; Butterworth, J M; Campanelli, M; Carli, T; Choudalakis, G; Delsart, P A; De Cecco, S; Deviveiros, P O; D'Onofrio, M et al.
ATL-COM-PHYS-2009-630. - Geneva: CERN, 2009 - 82 p.

78. General searches for new particles / Boomsma, J (ANL); Chekanov, S (ANL)
ATL-COM-PHYS-2009-619. - Geneva: CERN, 2009 - 11 p.

79. Search for squarks and gluinos using final states with jets and missing transverse momentum with the ATLAS experiment in sqrt(s) = 7 TeV proton-proton collisions: supporting documentation / Asai, S ; Ask, S ; Baak, M ; Barr, A J ; Bruneliere, R ; Caron, S ; Chavez Baraja, C ; Consorti, V ; Cote, D ; Dietrich, J et al.
ATL-PHYS-INT-2012-012. - Geneva: CERN, 2012

80. Measurement of the isolated photon plus jet cross section in pp collisions at sqrt(s) = 7 TeV with the ATLAS detector / Cantero, J, et al.
ATL-PHYS-INT-2012-039. - Geneva: CERN, 2012

81. 81. Measurement of the cross section for jets produced in association with a W -boson in pp collisions at s √ = 7 TeV / Arabidze, G ; Berglund, E ; Bruneliere, R ; Calfayan, P ; Consonni, M ; Devetak, E ; Dunford, M ; Fiascaris, M ; Hara, K ; Hayashi, T et al.
ATL-PHYS-INT-2012-003. - Geneva: CERN, 2012 Full text: PDF; External link: Original Communication

82. Further search for squarks and gluinos using final states with jets and missing transverse momentum with the ATLAS experiment in √s = 7 TeV proton-proton collisions: supporting documentation / Asai, S ; Ask, S ;Baak, M ; Barr, A J ; Bruneliere, R ; Caron, S ; Chavez Baraja, C ; Consorti, V ; Cote, D ; Dietrich, J et al.
ATL-PHYS-INT-2011-085. - Geneva: CERN, 2011

83. Measurement of the inclusive isolated prompt photon cross section in pp collisions at s √ = 7 TeV with the ATLAS detector using 35 pb −1 / Abreu, H ; Brelier, B ; Bucci, F ; Carminati, L ; Chekanov, S ; Daya, R ; Delmastro, M ; Dova, MT ; Fanti, M ; Fayard, L et al.
ATL-PHYS-INT-2011-075. - Geneva: CERN, 2011

84. Measurement of the cross-section for jets produced in association with a W -boson in pp collisions at s √ = 7 TeV / Arabidze, G ; Berglund, E ; Bruneliere, R ; Calfayan, P ; Devetak, E ; Dunford, M ; Fiascaris, M ; Hara, K ; Hayashi, T ; Hobbs, J et al.
ATL-PHYS-INT-2011-067. - Geneva: CERN, 2011

85. Search for squarks and gluinos using final states with jets and missing transverse momentum with the ATLAS experiment in sqrt(s) = 7 TeV proton-proton collisions: supporting documentation / Asai, S ; Ask, S ; Baak, M ; Barr, A J ; Bruneliere, R ; Caron, S ; Chavez Barajas, C ; Consorti, V ; Cote, D ; Duflot, L et al.
ATL-PHYS-INT-2011-055. - Geneva: CERN, 2011

86. Measurement of the inclusive isolated prompt photon cross section in pp collisions at s √ = 7 TeV with the ATLAS detector using 35 pb −1 / Abreu, H ; Brelier, B ; Bucci, F ; Carminati, L ; Chekanov, S ; Daya, R ; Delmastro, M ; Dova, M T ; Fanti, M ; Fayard, L et al.
ATL-PHYS-INT-2011-037. - Geneva: CERN, 2011

87. Measurement of the cross-section for jets produced in association with a W-boson in pp collisions at sqrt(s) = 7 TeV / Ahmad, A ; Beauchemin, P ; Berglund, E ; Bierwagen, K ; Blumenschein, U ; Boveia, A ; Borroni, S ; Bruneliere, R ; Calfayan, P ; Deluca, C et al.
ATL-PHYS-INT-2011-020. - Geneva: CERN, 2011 - 68 p.

88. Underlying event particle flow based on calorimeter clusters in pp collisions at 7 TeV with the ATLAS detector at the LHC / Bertella, C ; Chekanov, S ; Giovaninni, P ; Kanaya, N ; Menke, S ; Proudfoot, J ; Roda, C ; Starovoitov, P ; Vivarelli, I ; Yoshida, R et al.
ATL-PHYS-INT-2011-022. - Geneva: CERN, 2011 - 37 p.

89. Underlying event particle flow based on calorimeter clusters in pp collisions at 900 GeV with the ATLAS detector at the LHC / Bertella, C ; Chekanov, S ; Giovaninni, P ; Kanaya, N ; Menke, S ; Proudfoot, J ; Roda, C ; Starovoitov, P ; Vivarelli, I ; Yoshida, R et al.
ATL-PHYS-INT-2011-021. - Geneva: CERN, 2011 - 30 p.

90. Theoretical Predictions for Measurements of the Inclusive Isolated Photon Cross Section in pp Collisions at s √ =7\TeV / Blair, B, et al
ATL-PHYS-INT-2011-016. - Geneva: CERN, 2011

91. Measurement of the inclusive isolated prompt photon cross section in pp collisions at sqrts=7TeV with the ATLAS detector / Abreu, H ; Andari, N ; Becot, C ; Blair, R ; Bucci, F ; Carminati, L ; Chekanov, S ; Dao, V ; Daya, R K ; Delmastro, M et al.
ATL-PHYS-INT-2011-013. - Geneva: CERN, 2011

92. Measurement of the cross-section for jets produced in association with a Z-boson in pp collisions at s √ = 7 TeV / Bauchemin, H ; Berglund, E ; Bierwagen, K ; Blumenschein, U ; Borroni, S ; Brandt, G ; Bruneliere, R ; Buchanan, J ; Calfayan, P ; Carrillo-Montoya, G et al.
ATL-PHYS-INT-2011-006. - Geneva: CERN, 2011

93. Performance of Jet Algorithms in the ATLAS Detector / Asquith, L ; Brelier, B ; Butterworth, J M ; Campanelli, M ; Carli, T ; Choudalakis, G ; Delsart, P A ; De Cecco, S ; Deviveiros, P O ; D'Onofrio, M et al.
ATL-PHYS-INT-2010-129. - Geneva: CERN, 2010 - 82 p.

94. Update: Track-based underlying event measurements in pp collisions at sqrt(s) = 900 GeV and 7 TeV with the ATLAS Detector at the LHC / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATL-PHYS-INT-2010-128. - Geneva: CERN, 2010

95. Additional plots for track-based underlying event measurement / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATL-PHYS-INT-2010-127. - Geneva: CERN, 2010

96. Measurement of inclusive jet and dijet cross sections in proton-proton collisions at 7 TeV centre-of-mass energy with the ATLAS detector / Baker, S ; Begel, M ; Boelaert, N ; Butterworth, J ; Buckingham, R ; Campanelli, M ; Carli, T ; Cavasinni, V ; Choudalakis, G ; Demirkoz, B et al.
ATL-PHYS-INT-2010-119. - Geneva: CERN, 2010 - 92 p. Original Communication (restricted to ATLAS)

97. Track-based underlying event measurements in pp collisions at sqrt{s} = 900 GeV with the ATLAS Detector at the LHC / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al. Task Physics
ATL-PHYS-INT-2010-107. - Geneva: CERN, 2010

98. Track-based underlying event measurements in pp collisions at sqrt{s} = 7 TeV with the ATLAS Detector at the LHC / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al. Task Physics
ATL-PHYS-INT-2010-106. - Geneva: CERN, 2010

99. Track-based underlying event measurements in pp collisions at sqrt{s} = 900 GeV and 7 TeV with the ATLAS Detector at the LHC / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al. Task Physics
ATL-PHYS-INT-2010-105. - Geneva: CERN, 2010

100. Measurement of jet production in 7 TeV proton-proton collision with the ATLAS detector / Baker, S ; Begel, M ; Boelaert, N ; Butterworth, J ; Buckingham, R ; Campanelli, M ; Carli, T ; Cavasinni, V ; Choudalakis, G ; Demirkoz, B et al. Task Physics
ATL-PHYS-INT-2010-103. - Geneva: CERN, 2010

101. Comparison of MC based Jet Energy Scales applied after H1 calibration / Salvachúa, B (Argonne National Laboratory); Chekanov, S (Argonne National Laboratory) ; Proudfoot, J (Argonne National Laboratory)
ATL-PHYS-INT-2009-050; ATL-COM-PHYS-2009-162. - Geneva: CERN, 2009 - 36 p.

102. Searches for new physics with jets in ATLAS / Salvachua, B (ANL)
ATL-PHYS-PROC-2011-066. - 2011. - 8 p.

103. Precision tests of the Standard Model using the ATLAS detector at the LHC / Chekanov, S (Argonne)
ATL-PHYS-PROC-2011-028. - 2011. - 11 p.

104. Soft QCD Measurements at 900 GeV and 7 TeV with ATLAS / Proudfoot, J
ATL-PHYS-PROC-2010-060. - 2010. - 4 p.

105. Test of the Jet Reconstruction and Calibration analyzing the invariant mass of the W decay products / Salvachúa, B (Argonne National Laboratory); Proudfoot, J (Argonne National Laboratory)
ATL-COM-PHYS-2009-385. - Geneva: CERN, 2009 - 13 p. 9.

106. Triggering on Long-Lived Neutral Particles in the ATLAS Detector / The ATLAS Collaboration
ATL-PHYS-PUB-2009-082; ATL-COM-PHYS-2009-233. - 2009. - 22 p.

CONFERENCE NOTES

1. ATLAS measurements of the properties of jets for boosted particle searches / Alon, R et al.
ATLAS-COM-CONF-2012-063. - Geneva: CERN, 2012 - 22 p.

2. Search for the Standard Model Higgs boson produced in association with a vector boson and decaying to a b-quark pair with the ATLAS detector at the LHC / Ahmadov, F et al.
ATLAS-COM-CONF-2011-121. - Geneva: CERN, 2011

3. Measurement of Jet Mass and Substructure for Inclusive Jets in √s = 7 TeV pp Collisions with the ATLAS Experiment / Alon, R; Asquith, L; Baker, S; Bergeaas Kuutmann, E; Chapleau, B; Chekanov, S; Davison, A R; Duchovni, E; Farooque, T; Ferrando, J et al.
ATLAS-COM-CONF-2011-084. - Geneva: CERN, 2011

4. Measurement of the production cross section for W-bosons in association with jets in pp collisions using 33 pb-1 at sqrt(s) = 7 TeV with the ATLAS detector / Arabidze, G; Berglund, E; Bruneliere, R; Calfayan, P; Devetak, E; Dunford, M; Fiascaris, M; Hara, K; Hayashi, T; Hobbs, J et al.
ATLAS-COM-CONF-2011-063. - Geneva: CERN, 2011 - 17 p.

5. Measurement of inclusive jet and dijet cross sections in proton-proton collision data at 7 TeV centre-of-mass energy using the ATLAS detector / Baker, S et al.
ATLAS-COM-CONF-2011-052. - Geneva: CERN, 2011 - 51 p.

6. Measurement of underlying event characteristics using charged particles in pp collisions at sqrt{s} =900 GeV and 7 TeV with the ATLAS detector in a limited phase space / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATLAS-COM-CONF-2011-012. - Geneva: CERN, 2011

7. Track-based underlying event measurements in pp collisions at sqrt{s} = 900 GeV and 7 TeV with the ATLAS Detector at the LHC / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATLAS-COM-CONF-2010-092. - Geneva: CERN, 2010

8. Performance of the Minimum Bias Trigger in p-p Collisions at Sqrt(S) = 7 TeV / Bell, W H et al.
ATLAS-COM-CONF-2010-069. - Geneva: CERN, 2010

9. Jet energy scale and its systematic uncertainty in ATLAS for jets produced in proton-proton collisions at sqrts=7 ~TeV / Begel, M; Carli, T; Demirkoz, B; Doglioni, C; DeViveiros, P-O; Duehrssen, M; Eckweiler, S; Francavilla, P; Fullana Torregrosa, E; Gillberg, D et al.
ATLAS-COM-CONF-2010-058. - Geneva: CERN, 2010 - 23 p.

10. Track-based underlying event measurements in pp collisions at sqrt{s} = 900 GeV and 7 TeV with the ATLAS Detector at the LHC / Buckley, A; Chekanov, S; Hare, G; Kar, D; Moraes, A; Nielsen, J; Proudfoot, J; Straessner, A; Yoshida, R; Wahrmund, S et al.
ATLAS-COM-CONF-2010-029. - Geneva: CERN, 2010

<u>CALORIMETER</u>

1. Analysis of TileCal fLVPS Trip Characteristics / Norberg, S (ANL); Proudfoot, J (ANL); Chekanov, S (ANL)
ATL-COM-TILECAL-2011-056. - Geneva: CERN, 2011 - 10 p.

2. An Upgraded Front-End Switching Power Supply Design for the ATLAS TileCAL Detector of the LHC / Drake, G (Argonne National Laboratory); Cundiff, T (Argonne National Laboratory); De Lurgio, P (Argonne National Laboratory); Henriques, A (CERN); Minashvili, I (Joint Institute for Nuclear Research); Nemecek, S (Institute of Physics, Academy of Sciences of the Czech Republic); Price, L (Argonne National Laboratory); Proudfoot, J (Argonne National Laboratory); Stanek, R (Argonne National Laboratory)
ATL-COM-TILECAL-2011-055. - Geneva: CERN, 2011 - 8 p.

3. The Optical Instrumentation of the ATLAS Tile Calorimeter / Abdallah, J; Adragna, P; Alexa, C; Alves, R; Amaral, P; Ananiev, A; Anderson, K; Andresen, X; Antonaki, A; Batusov, V et al.
ATL-COM-TILECAL-2011-054. - Geneva: CERN, 2011 - 15 p.

4. An Upgraded Front-End Switching Power Supply Design For the ATLAS TileCAL Detector of the LHC / Drake, Gary (Argonne National Laboratory)
ATL-COM-TILECAL-2011-037; - Geneva: CERN, 2011 - 1 p.

5. Offline LVPS trip monitoring. Software implementation / Chekanov, S (ANL); Norberg, S (ANL/University of Oklahoma); Proudfoot, J (ANL)
ATL-COM-TILECAL-2011-020. - Geneva: CERN, 2011 - 7 p.

6. Analysis of TileCal fLVPS Trip Characteristics / Chekanov, S (ANL); Norberg, S (ANL/University of Oklahoma); Proudfoot, J (ANL)
ATL-COM-TILECAL-2011-019. - Geneva: CERN, 2011 - 11 p.

7. An Upgraded Front-End Switching Power Supply Design for the ATLAS TileCAL Detector of the LHC / Drake, G, et al.
ATL-TILECAL-PROC-2011-015. - 2011. - 8 p.

8. Upgrade Design of TileCal Front-end Readout Electronics and Radiation Hardness Studies / Anderson, K (Enrico Fermi Institute, University of Chicago); Bohm, C (Stockholm University); Drake, G (Argonne National Laboratory); Eriksson, D (Stockholm University); Muschter, S (Stockholm University); Oreglia, M (Enrico Fermi Institute, University of Chicago); Pilcher, J (Enrico Fermi Institute, University of Chicago); Price, L (Argonne National Laboratory); Tang, F (Enrico Fermi Institute, University of Chicago)
ATL-COM-TILECAL-2011-012. - Geneva: CERN, 2011

9. A Layer Correlation technique for pion energy calibration at the 2004 ATLAS Combined Beam Test / Abat, E; Abdallah, J M; Addy, T N; Adragna, P; Aharrouche, M; Ahmad, A; Akesson, T P A; Aleksa, M; Alexa, C; Anderson, K et al.
ATL-COM-CAL-2010-006. - Geneva: CERN, 2010 - 33 p.

10. Response and Shower Topology of 2 to 180 GeV Pions Measured with the ATLAS Barrel Calorimeter at the CERN Test-beam and Comparison to Monte Carlo Simulations / Abat, E; Abdallah, J M; Addy, T N; Adragna, P; Aharrouche, M; Ahmad, A; Akesson, T P A; Aleksa, M; Alexa, C; Anderson, K et al.
ATL-COM-CAL-2010-004. - Geneva: CERN, 2010 - 92 p.

11. Online energy and phase reconstruction during commissioning phase of the ATLAS Tile Calorimeter / Salvachúa, B ; Abdallah, J ; Castillo, V ; Cuenca, C ; Ferrer, A ; Fullana, E ; González, V ; Higón, E ; Poveda, J ; Ruiz-Martinez, A et al. Task Calorimeter Working Group
ATL-TILECAL-INT-2010-003. - Geneva: CERN, 2010
ATLAS Notes 16 records found

12. Response and Shower Topology of 2 to 180 GeV Pions Measured with the ATLAS Barrel Calorimeter at the CERN Test-beam and Comparison to Monte Carlo Simulations / The ATLAS Collaboration
ATL-CAL-PUB-2010-001. - 2010. - 92 p.

TRIGGER/DAQ

1. ATLAS FTK: Fast Track Trigger / Amerio, S; Andreani, A; Andreazza, A; Annovi, A; Beretta, M; Bevacqua, V; Bogdan, M; Bossini, E; Boveia, A; Cavaliere, V et al.
ATL-COM-DAQ-2011-070. - Geneva: CERN, 2011 - 10 p.

2. ATLAS FTK: Fast Track Trigger / Amerio, S ; Andreani, A ; Andreazza, A ; Annovi, A ; Beretta, M ; Bevacqua, V ; Bogdan, M ; Bossini, E ; Boveia, A ; Cavaliere, V et al.
ATL-DAQ-PROC-2011-022. - 2011. - 10 p.

3. Muon Detection Based on a Hadronic Calorimeter / Ciodaro, T (Federal University of Rio de Janeiro); Abolins, M (-); Abreu, R (-); Achenbach, R (-); Adragna, P (-); Aharrouche, M (-); Aielli, G (-); Al-Shabibi, A (-); Aleksandrov, I (-); Alexandrov, E (-) et al.
ATL-COM-DAQ-2010-192. - Geneva: CERN, 2010 - 5 p.

4. Enhancement of the ATLAS Trigger System with a Hardware Tracker Finder FTK / Zhang, J (Argonne National Laboratory)
ATL-COM-DAQ-2010-185. - Geneva: CERN, 2010 - 5 p.

5. Muon Detection Based on a Hadronic Calorimeter / Ciodaro, T (Federal University of Rio de Janeiro); Abolins, M (-); Abreu, R (-); Achenbach, R (-); Adragna, P (-); Aharrouche, M (-); Aielli, G (-); Al-Shabibi, A (-); Aleksandrov, I (-); Alexandrov, E (-) et al.
ATL-COM-DAQ-2010-184. - Geneva: CERN, 2010 - 1 p.

6. Enhancement of the ATLAS Trigger System with a Hardware Tracker Finder FTK / Zhang, J (Argonne National Laboratory)
ATL-COM-DAQ-2010-135. - Geneva: CERN, 2010

7. Performance of the Minimum Bias Trigger in p-p Collisions at sqrt{s} = 7 TeV / Bell, W H (Université de Genève); Berge, D (CERN); Feng, E (University of Chicago); Kwee, R (CERN/Humboldt-Universitaet zu Berlin); Martin, B T (Michigan State University); Martin, T (University of Birmingham); Messina, A (CERN); Nurse, E (University College London); Paramonov, A (Argonne National Laboratory); Tompkins, L (Lawrence Berkeley National Laboratory) et al.
ATL-COM-DAQ-2010-087. - Geneva: CERN, 2010 - 10 p.

8. Muon Detection Based on a Hadronic Calorimeter / on behalf of the ATLAS TDAQ collaboration
The ATLAS Tile hadronic calorimeter (TileCal) provides highly-segmented energy measurements of incoming particles. [...]
ATL-DAQ-PROC-2010-050. - 2010. - 5 p.

9. Enhancement of the ATLAS Trigger System with a Hardware Tracker Finder FTK / Zhang, J et al.
ATL-DAQ-PROC-2010-043. - 2010. - 5 p.

10. ATLAS Data Acquisition / Zhang, J (Argonne National Laboratory)
ATL-DAQ-PROC-2010-005. - 2010. - 4 p.

11. ATLAS Data Acquisition / Zhang, J (Argonne National Laboratory)
ATL-COM-DAQ-2009-055. - Geneva: CERN, 2009 - 4 p.

12. Approval request for cosmic plots of TileMuId algorithm / Lim, H (Argonne National Laboratory); Ruiz-Martinez, A (Instituto de Fisica Corpuscular (IFIC) UV-CSIC)
ATL-COM-DAQ-2009-029. - Geneva: CERN, 2009 - 3 p.

SOFTWARE

1. An extensible infrastructure for querying and mining event-level metadata in ATLAS / Malon, D; Cranshaw, J; Zhang, Q
ATL-COM-SOFT-2012-100. - Geneva: CERN, 2012

2. I/O Strategies for Multicore Processing in ATLAS / van Gemmeren, P (Argonne National Laboratory, Argonne, Illinois 60439, USA); Binet, S (Laboratoire de l'Accélérateur Linéaire/IN2P3, 91898 Orsay Cédex, France); Calafiura, P (Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA); Lavrijsen, W (Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA); Malon, D (Argonne National Laboratory, Argonne, Illinois 60439, USA); Tsulaia, V (Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA)
ATL-COM-SOFT-2012-072. - Geneva: CERN, 2012 - 9 p.

3. The ATLAS ROOT-based data formats: recent improvements and performance measurements / Bhimji, W; Cranshaw, J; van Gemmeren, P; Malon, D; Schaffer, R D; Vukotic, I
ATL-COM-SOFT-2012-054. - Geneva: CERN, 2012 - 10 p.

4. TAG Based Skimming In ATLAS / Doherty, T (University of Glasgow); Cranshaw, J (Argonne National Laboratory); Hrivnac, J (LAL); Slater, M (University of Birmingham); Nowak, M (Brookhaven National Laboratory); Quilty, D (University of Glasgow); Zhang, Q (Argonne National Laboratory)
ATL-COM-SOFT-2012-035. - Geneva: CERN, 2012 - 1 p.

5. TAG Based Skimming in ATLAS / Doherty, T (University of Glasgow); Cranshaw, J (Argonne National Laboratory); Hrivnac, J (LAL); Slater, M (University of Birmingham); Nowak, M (Brookhaven National Laboratory); Quilty, D (University of Glasgow); Zhang, Q (Argonne National Laboratory)
ATL-COM-SOFT-2012-030. - Geneva: CERN, 2012 - 10 p.

6. Multicore in Production: Advantages and Limits of the Multiprocess Approach / Binet, S (LAL); Calafiura, P (LBL); Lavrijsen, W (LBL); Leggett, Ch (LBL); Lesny, D (Univ of Illinois Urbana-Champaign); Jha, M K (INFN Napoli); Severini, H (Univ of Oklahoma); Smith, D (SLAC); Snyder, S (BNL); Tatarkhanov, M (LBL) et al.
ATL-COM-SOFT-2011-017. - Geneva: CERN, 2011 - 24 p.

7. ATLAS Detector Data Processing on the Grid: Prepared for submission to 2011 IEEE NSS-MIC Conference Record / Vaniachine, A V (Argonne)
ATL-COM-SOFT-2011-035. - Geneva: CERN, 2011 - 3 p.

8. ATLAS Detector Data Processing on the Grid / Klimentov, A; Nevski, P; Strandberg, J; Tojo, J; Vaniachine, A; Walker, R
ATL-COM-SOFT-2011-031. - Geneva: CERN, 2011 - 12 p.

9. TAG on the Grid: Timing Studies / Cranshaw, J (Argonne National Laboratory)
ATL-COM-SOFT-2011-020. - Geneva: CERN, 2011 - 8 p.

10. ATLAS Detector Data Processing on the Grid : Summary of the paper submitted to 2011 IEEE NSS-MIC Conference / Klimentov, A (BNL); Nevski, P (BNL); Strandberg, J (KTH); Tojo, J (KEK); Vaniachine, A (Argonne); Walker, R (LMU)
ATL-COM-SOFT-2011-012. - Geneva: CERN, 2011 - 2 p.

11. Scaling up ATLAS Database Release Technology for the LHC Long Run / Borodin, M; Nevski, P; Vaniachine, A
ATL-COM-SOFT-2011-001. - Geneva: CERN, 2011 - 6 p.

12. Optimization and performance measurements of ROOT-based data formats in the ATLAS experiment / Schaffer, RD; Bhimji, W; Biscarat, C; Brandt, G; Duckeck, G; van Gemmeren, P; Peters, A; Vukotic, I
ATL-COM-SOFT-2010-081. - Geneva: CERN, 2010 - 6 p.

13. Scaling up ATLAS Database Release Technology for the LHC Long Run / Borodin, M (MEPhI/CERN); Nevski, P (BNL); Vaniachine, A (Argonne)
ATL-COM-SOFT-2010-060. - Geneva: CERN, 2010 - 15 p.

14. Design and Performance of ATLAS Tier 3 Computing Facility Based on Virtual Machine Technology / Benjamin, D (Duke University); Blomer , J (CERN); Fernando , W (Argonne National Laboratory); Kagan , H (Ohio State University); Panitkin , SY (Brookhaven National Laboratory); Yao , Y (Lawrence Berkeley National Laboratory)
ATL-COM-SOFT-2010-055. - Geneva: CERN, 2010 - 1 p.

15. IO performance of ATLAS data formats / Schaffer, RD; Bhimji, W; Biscarat, C; Brandt, G; Duckeck, G; van Gemmeren, P; Peters, A; Vukotic, I
ATL-COM-SOFT-2010-034. - Geneva: CERN, 2010 - 25 p.

16. Databases in LHC Experiments: Usage and Lessons Learned: Invited talk at the SuperB Computing R&D Workshop, March 9-12, 2010, Ferrara, Italy / Vaniachine, A (Argonne)
ATL-COM-SOFT-2010-010. - Geneva: CERN, 2010 - 53 p.

17. Strategy for Remote Access to ATLAS Database Resident Information / Barberis, D (Genova); Gallas, E (Oxford); Hawkings, R (CERN); Vaniachine, A (ANL)
ATL-COM-SOFT-2009-017. - Geneva: CERN, 2009 - 9 p.

18. Scalable Database Access Technologies for ATLAS Distributed Computing / Vaniachine, A
ATL-COM-SOFT-2009-011; ANL-HEP-CP-09-085. - Geneva: CERN, 2009 - 6 p.

19. ATLAS Detector Data Processing on the Grid / Vaniachine, A V (Argonne)
The ATLAS detector is in the second year of continuous LHC running. [...]
ATL-SOFT-PROC-2011-046. - 2011. - 3 p.

20. ATLAS Detector Data Processing on the Grid / Klimentov, A (BNL) ; Nevski, P (BNL) ; Strandberg, J (KTH) ; Tojo, J (KEK) ; Vaniachine, A (Argonne) ; Walker, R (LMU)
ATL-SOFT-PROC-2011-042. - 2011. - 2 p.

21. Scaling up ATLAS Database Release Technology for the LHC Long Run / Borodin, M; Nevski, P; Vaniachine, A
ATL-SOFT-PROC-2011-035. - 2011. - 6 p.

22. Optimization and performance measurements of ROOT-based data formats in the ATLAS experiment / Schaffer, RD ; Bhimji, W ; Biscarat, C ; Brandt, G ; Duckeck, G ; van Gemmeren, P ; Peters, A ; Vukotic, I
ATL-SOFT-PROC-2011-027. - 2011. - 6 p.

23. Using TAGs to Speed up the ATLAS Analysis Process / for the ATLAS collaboration
ATL-SOFT-PROC-2011-003. - 2011. - 6 p.

GENERAL

1. Pileup Correction for Mass and Shapes of Boosted Jets in ATLAS / Alon, R et al
ATL-COM-GEN-2011-016. - Geneva: CERN, 2011 - 41 p.

2. Engineering the ATLAS TAG Browser / Zhang, Q (Argonne National Laboratory)
ATL-COM-GEN-2010-044. - Geneva: CERN, 2010 - 1 p.

3. Estimation of QCD Backgrounds for W->munu + N-jets Using Template Method / Johnson, A (Carnegie Mellon University); Paramonov, A (Argonne National Laboratory)
ATL-COM-GEN-2010-037. - Geneva: CERN, 2010 - 27 p.

4. Track Reconstruction Efficiency in 900 GeV Data / Arguin, J et al.
ATL-COM-INDET-2010-010. - Geneva: CERN, 2010

5. An Integrated Overview of Metadata in ATLAS / Gallas, EJ; Malon, D; Hawkings, RJ; Albrand, S; Torrence, E
ATL-COM-GEN-2009-032. - Geneva: CERN, 2009 - 10 p.

6. Data Quality Status Flags and Good Run Lists for Physics Analysis in ATLAS / Baak, M; Guyot, C; Hauschild, M; Hawkings, R; Heinemann, B; Höcker, A; Martínez-Pérez, M; Malon, D; Onyisi, P; Torrence, E
ATL-COM-GEN-2009-015. - Geneva: CERN, 2009 - 10 p.

SLIDES

1. W/Z + jets and W/Z + heavy flavor production at the LHC / Paramonov, AA (Argonne National Laboratory)
ATL-PHYS-SLIDE-2012-090. - Geneva: CERN, 2012 Fulltext: PDF; External link: Original Communication (restricted to ATLAS)
Presented at: 47th Rencontres de Moriond on QCD and High Energy Interactions, La Thuile, Italy, 10 - 17 Mar 2012

2. An Upgraded Front-End Switching Power Supply Design For the ATLAS TileCAL Detector of the LHC / Drake, Gary (Argonne National Laboratory)
ATL-TILECAL-SLIDE-2011-666. - Geneva: CERN, 2011 - 1 p. Fulltext: PPT; External link: Original

3. Engineering the ATLAS TAG Browser / Zhang, Q (Argonne National Laboratory)
ATL-GEN-SLIDE-2011-574. - Geneva: CERN, 2011 - 1 p. Full text: PDF; External link: Original

4. Multicore in Production: Advantages and Limits of the Multiprocess Approach / Binet, S (LAL) ; Calafiura, P (LBL) ; Lavrijsen, W (LBL) ; Leggett, Ch (LBL) ; Lesny, D (Univ of Illinois Urbana-Champaign) ; Jha, M K (INFN Napoli) ; Severini, H (Univ of Oklahoma) ; Smith, D (SLAC) ; Snyder, S (BNL) ; Tatarkhanov, M (LBL) et al.
ATL-SOFT-SLIDE-2011-506. - Geneva: CERN, 2011 - 24 p. Full text: PDF; External link: Original
Presented at: 14th International Workshop On Advanced Computing And Analysis Techniques In Physics Research, Uxbridge, West London, UK, 5 - 9 Sep 2011

5. Measuring non-standard jets with ATLAS / Asquith, L (Argonne National Laboratory)
Conference slides for Boost 2011 detailing measurements of non-standard jets with ATLAS..
ATL-PHYS-SLIDE-2011-265.- Geneva : CERN, 2011 - 19 p. Fulltext: PDF; External link: Original

6. Upgrade Design of TileCal Front-end Readout Electronics and Radiation Hardness Studies / Anderson, K (Enrico Fermi Institute, University of Chicago) ; Bohm, C (Stockholm University) ; Drake, G (Argonne National Laboratory) ; Eriksson, D (Stockholm University) ; Muschter, S (Stockholm University) ; Oreglia, M (Enrico Fermi Institute, University of Chicago) ; Pilcher, J (Enrico Fermi Institute, University of Chicago) ; Price, L (Argonne National Laboratory) ; Tang, F (Enrico Fermi Institute, University of Chicago)
ATL-TILECAL-SLIDE-2011-248. - Geneva: CERN, 2011 Full text: PDF; External link: Original Communication (restricted to ATLAS)
Presented at: 2nd International Conference on Technology and Instrumentation in Particle Physics, Chicago, IL, USA, 9 - 14 Jun 2011

7. Results from ATLAS / Zhang, J (Argonne National Laboratory)
ATL-PHYS-SLIDE-2011-147. - Geneva: CERN, 2011

8. Scaling up ATLAS Database Release Technology for the LHC Long Run / Borodin, M (MEPhI/CERN); Nevski, P (BNL); Vaniachine, A (Argonne)
ATL-SOFT-SLIDE-2010-405. - Geneva: CERN, 2010 - 15 p.
Presented at: Conference on Computing in High Energy and Nuclear Physics 2010, Taipei, Taiwan, 18 - 22 Oct 2010

9. IO performance of ATLAS data formats / Schaffer, RD ; Bhimji, W ; Biscarat, C ; Brandt, G ; Duckeck, G ; van Gemmeren, P ; Peters, A ; Vukotic, I
ATL-SOFT-SLIDE-2010-381. - Geneva: CERN, 2010 - 25 p.

10. Design and Performance of ATLAS Tier 3 Computing Facility Based on Virtual Machine Technology / Benjamin, D (Duke University) ; Blomer, J (CERN) ; Fernando, W (Argonne National Laboratory) ; Kagan, H (Ohio State University) ; Panitkin, SY (Brookhaven National Laboratory) ; Yao, Y (Lawrence Berkeley National Laboratory) /The ATLAS collaboration
ATL-SOFT-SLIDE-2010-372. - Geneva: CERN, 2010 - 1 p. Full text: PDF; External link: Original Communication (restricted to ATLAS)
Presented at: Conference on Computing in High Energy and Nuclear Physics 2010, Taipei, Taiwan, 18 - 22 Oct 2010

11. Enhancement of the ATLAS Trigger System with a Hardware Tracker Finder FTK / Zhang, J (Argonne National Laboratory)
ATL-DAQ-SLIDE-2010-307. - Geneva: CERN, 2010

12. Soft QCD Measurements at 900 GeV and 7 TeV with ATLAS / Proudfoot, J
ATL-PHYS-SLIDE-2010-185. - Geneva: CERN, 2010
Presented at: 15th High-Energy Physics International Conference in Quantum Chromodynamics (QCD), Montpellier, France, 28 Jun - 3 Jul 2010

13. ATLAS DAQ and Controls / Zhang, J (Argonne National Laboratory) /on behalf of the ATLAS collaboration ATLAS is a general purpose High Energy Physics experiment at the Large Hadron Collider (LHC). The trigger/data acquisition (TDAQ) system is designed to handle the extremely high data rates. [...]ATL-DAQ-SLIDE-2009-094; ATL-COM-DAQ-2009-032. - Geneva: CERN, 2009

8. APPENDIX D: Editorial Boards and Community Service

Membership in ATLAS Internal Review Boards (Editorial Boards)

Eric Feng

Search for W' resonance decaying to WZ in the 4 jets or 2 fat jet final states

Sergei Chekanov

Events shapes measured in inclusive events in ATLAS

Measurement of hadronic event shapes at high Q2 with the ATLAS detector in pp collisions at sqrt(s) = 7 TeV

Tom LeCompte

Observation of a new chi_b state in radiative transitions to Upsilon (1S) and Upsilon (2S) at ATLAS (chair); submitted PRL (2011/12/21)

Search for new particles decaying to ZZ using final states with leptons and jets with the ATLAS detector in sqrt(s) =7 TeV proton-proton collisions {chair; submitted PLB (2012/03/04)}

Search for the Standard Model Higgs boson in the decay channel H -> ZZ (*) -> 4l with the ATLAS detector {chair; submitted PLB (2011/09/27)}

Search for the Standard Model Higgs boson in the decay channel H->ZZ (*) ->4l with 4.8 fb-1 of pp collisions at sqrt(s) =7 TeV with ATLAS {chair; submitted PLB (2012/02/07)}

Observation of a centrality-dependent dijet asymmetry in lead-lead collisions at sqrt(sNN) = 2.76 TeV with the ATLAS detector {submitted PRL (2010/11/25)}

Measurement of the centrality dependence of J/ψ yields and observation of Z production in lead-lead collisions with the ATLAS detector at the LHC {submitted PLB (2010/12/24)}

Measurement of the pseudorapidity and transverse momentum dependence of the elliptic flow of charged particles in lead-lead collisions at sqrt(s_NN) = 2.76 TeV with the ATLAS detector {submitted PLB (2011/08/30)}

Larry Nodulman

Measurement of the inclusive W+- and Z/gamma cross sections in the electron and muon decay channels in pp collisions at sqrt(s) = 7 TeV with the ATLAS detector {submitted PRD (2011/09/26)}

Search for b' production in the Wt single top channel

Rik Yoshida

Search for the Standard Model Higgs boson in the diphoton decay channel with 4.9 fb-1 of pp collisions at sqrt(s) =7 TeV with ATLAS {chair; submitted PRL (2012/02/07)}

Search for a fermiophobic Higgs boson in the diphoton decay channel with the ATLAS detector {chair; submitted EPJC (2012/05/03)}

Measurement of the Muon Charge Asymmetry from W Bosons Produced in pp Collisions at √s = 7 TeV with the ATLAS detector {submitted PLB (2011/03/15)}

Measurement of the Top Quark Mass with the Template Method in the ttbar -> lepton+jets Channel using ATLAS Data {chair); submitted EPJC (2012/03/26)}

Community Service

Lily Asquith

Quarknet speaker and workshop leader, 2011-2012

SCSW ("Science Careers in Search of Women") ANL poster 2011-2012

Public outreach blogs on the guardian: http://www.guardian.co.uk/search?q=lily+asquith&section=science

LHCSound: http://lhcsound.hep.ucl.ac.uk/

Bob Blair

DOE HEP ARRA reviewer 2009

Reviewer, DOE early career award (mail in) 2009

Reviewer, advanced detector research program 2011

Referee for PLB

Sergei Chekanov

Referee for PRD and J.Phys.G.

Jack Cranshaw

Science fair judge, Mariano Azuala School, Chicago 2011

Outreach presentations Tibbott Elementary School, Bolingbrook, St. Paul Lutheran School, Brookfield, 2012

Tom LeCompte

Referee/panelist for grant proposals for the NSF, DoE, Israeli-American Binational Science Foundation, and the Israeli Science Foundation

LHC Theory Initiative awards committee.

Physics at the LHC 2010 Program committee

Session convener, Physics at the LHC 2010

Hadron Collider Physics 2010 International Organizing Committee

Session convener, Hadron Collider Physics 2010

HCPSS 2010 Organizing Committee (student selection)

Les Houches 2011 Advisory committee

Program committee co-chair, Physics at the LHC 2011

Session convener, European Physical Society 2011

Local organizing committee, US LHC Users Annual Meeting, Nov, 2011

Session convener, 23rd Rencontres de Blois S

Higgs at the Magnificent Mile Workshop 2012 Organizing Committee

Lecturer, CTEQ Summer School, CERN 2012

David Malon

International Advisory Committee for the CHEP (Computing in High Energy and Nuclear Physics) series of conferences.

Editorial board of the Journal of Reliability, Quality, and Safety Engineering.

PhD committee of a computer science student, Elisabeth Vinek, at the University of Vienna (PhD 2011)

Larry Nodulman

Referee for PLB, JHEP, PRD

DOE early career award reviewer (mail in) 2010

CDF tour guide

Alexander Paramonov

Session chair, BNL workshop on SUSY. May 2012

Panel member and co-organizer, Chicagoland and Midwest Dark Matter Workshop, 2012

Referee for PRL, PLB

Jimmy Proudfoot

DOE Panel, Early Career Panel Peer Review, Jan 2011

DOE Panel, Heavy Photon Search Review (HPS) at JLab, March 2011

Fermilab Internal Review, Nova Block Pivoter, March 2011

DOE Panel, ALICE CD4 Review, August 2011

Local organizing committee, US LHC Users Annual Meeting, Nov, 2011

NSF EPP2010 Panel, Dec 2009

DOE Review MIT, July 2010

DOE reviewer for early career proposals (mail in, 2010)

NOvA Director's Review – Fermilab, Aug 4/5 2010

Alexandre Vaniachine

Advisory committee, International Conference on Distributed Computing and Grid Technologies in Science and Education, 2012

Program committee, International Symposium on Nuclear Electronics and Computing, 2011

Referee for IEEE TNS, J. Phys.DOE SBIR reviewer

Rik Yoshida

DESY Physics Research Committee (2010-Present)

DOE/NSF LHC review 8-9 March, 2011, reviewer of US CMS Operations

Organizing committee for the CTEQ workshop “Standard Benchmark Processes at the Tevatron and LHC” November 2010.

Organizing committee of the “Standard Benchmark Workshop” Zeuthen, Germany, June 2011.

DOE Fermilab S&T review: 12-14, July, 2010, FNAL

International Advisory Committee of the conference series “International Conference on Calorimetry in Particle Physics” (1997-2011)

Member LHC experiments Committee (LHCC) CERN (2005-2009)

Local Organizing Committee, US LHC Users Organization Annual Meeting, ANL, 2011.

Organizing Committee of the CTEQ workshop, “Confronting Theory with Experiment: Puzzles, Challenges and Opportunities in the LHC Era” November 2011

Committee, Lehman Review mu2e, Fermilab, June, 2012

9. APPENDIX E: ANL ATLAS Group

ANL ATLAS Group

Lily Asquith	Postdoc
Ben Auerbach	Postdoc
Jerry Blazey	Joint faculty position with NIU (left 2011 for OSTP)
Jack Cranshaw	Computing Software Professional
Bob Blair	Physicist
Sergei Chekanov	Physicist
Denis Fellman	Electronics Software Professional (let go 2012 due to loss of funding)
Eric Feng	Argonne Named Postdoctoral Fellow
Esteban Fullana	Postdoc (left 2010 for a Marie-Curie Fellowship)
Peter van Gemmeren	Computing Software Professional
Tom LeCompte	Physicist
Guilherme Lima	Joint research position with NIU (left 2011)
Jeremy Love	Postdoc (joined June 2012)
David Malon	Computing Software Professional
Larry Nodulman	Physicist
Duong Ngyuen	Postdoc
Sasha Paramonov	Argonne Named Postdoctoral Fellow
Larry Price	Physicist (retired 2011)
Jimmy Proudfoot	Physicist
Belen Salvachua	Postdoc (left 2011 for CERN Fellowship)
Bob Stanek	Physicist
Sasha Vaniachine	Computing Software Professional
Rik Yoshida	Physicist
Jinlong Zhang	Physicist
Qizhi Zhang	Computing Software Professional

10. APPENDIX F: Curriculum Vitae

Robert Eugene Blair

High Energy Physics Division
Argonne National Laboratory
Argonne, IL 60439

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E-mail : reb@anl.gov

Education:

B.S. (Physics and English) Carnegie-Mellon University (1971)
Ph.D. (Physics) California Institute of Technology (1981)

Professional Employment:

Physicist, ANL (1989-present)
Assistant Physicist, ANL (1986-1989)
Assistant Professor, Columbia University (1983-1986)
Postdoctoral Fellow, Columbia University (1982-1983)

Awards, Memberships, and Professional Service:
Publications (654) with 30924 citations
D.O.E. Review panels (CMS Lehman Review, 7 SBIR reviews, 9 remote reviews for DOE proposals)
Invited talks (7 at international conferences)
Additional published conference proceedings (44)
Unpublished technical reports (32)
CDF Service work (QCD convener, Photon Group convener)
ATLAS service work (TDAQ coordination group, L2 manager for USATLAS trigger)

Selected Research Accomplishments

Fermilab E356 neutrino experiment cross section measurement (1979-1983)
Demonstration of CDF prompt photon reconstruction (1988)
Initiated isolation triggers for photon measurement in CDF (1988- present)
Initiated CDF preshower detector project (1988- present)
Developed CDF photon physics program (1988-1996)
Inclusive CDF photon cross-section measurement (1992)
Initiated Region of Interest builder for ATLAS trigger (1996- present)
CDF Diphoton cross-section measurements (1994 & 2005)
ATLAS photon cross-section measurement (2010)

Selected Publications (Robert E. Blair):

1. Monitoring and Calibration System for Neutrino Flux Measurement in a High-Energy Dichromatic Beam, Nucl. Instrum. Meth.A226:281 (1984)

2. Measurement of the Rate of Increase of Neutrino Cross-Sections with Energy, Phys.Rev.Lett.51:343-346 (1983).

3. A Prompt photon cross-section measurement in anti-p p collisions at s** (1/2) = 1.8- TeV, Phys.Rev.D48:2998-3025 (1993).

4. A Precision measurement of the prompt photon cross-section in p anti-p collisions at S** (1/2) = 1.8-TeV, Phys.Rev.Lett.73:2662-2666 (1994).

5. Searches for new physics in diphoton events in p anti-p collisions at s** (1/2) = 1.8-TeV, Phys.Rev.D59:092002 (1999.)

6. Measurement of the cross section for prompt diphoton production in p anti-p collisions at s** (1/2) = 1.96-TeV, Phys.Rev.Lett.95:022003 (2005).

7. The ATLAS High Level Trigger Region of Interest Builder, JINST 3:P04001 (2008).

8. Measurement of the inclusive isolated prompt photon cross section in pp collisions at sqrt(s) = 7 TeV using 35 pb-1 of ATLAS data, Phys.Lett.B 706 (2011) 150-167.

Sergei Chekanov

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Phone: 630-252-6541
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E-mail: chakanau@hep.anl.gov
http://www.hep.anl.gov/chakanau/

Education:

B.S., Belorussian State Univ. Minsk, USSR 1992
Ph.D., Exp. Physics. Nijmegen/HEFIN, The Netherlands 1997

Professional Employment:

Scientist, ANL (2008- Present)
Assistant Physicist, ANL (2001-2008)
Postdoctoral Fellow, ANL (1998-2001)
Postdoctoral Fellow, Nijmegen/HEFIN, Netherlands (1997)

Awards, Memberships, and Professional Service

HEP division computing group leader (2008- present)
Computing leader of the ATLAS group & Analysis Support Center at ANL (2008- present)
TileCal calorimeter DQM developer (2008-2009)
TileCal calorimeter shifts and data-quality validator (2009- present)
Convener of the QCD group of the ZEUS experiment at DESY, Germany (2001-2007)
Construction and operation of ZEUS preshower detector (1998-2008)
ZEUS Calorimeter First Level Trigger Processor (CFLTP) (2004-2007)
Referee for Phys. Rev. D and J.Phys. G (2002- present)
Conference and workshop organization (5) (1992-2008)

Selected Research Accomplishments:

Talks: Invited talks (26 at international conferences), Seminars (10);
Conference summary talk (1), Personal publications
Publications: total (350) with 6000 citations; Primary author of more than 50 publications in refereed journals; Primary author of 18 experimental papers (written + data analysis for ZEUS, L3, ATLAS experiments); Published conference proceedings (42); Unpublished technical reports total (60); ATLAS Communication notes (40), 23 where the main author.
Software & other: Initiated and the main developer of 5 major software projects (runmc, jhepwork, arcond, cernliblite, jminhep). Book: “Scientific Data Analysis using Jython Scripting and Java”, 2011, Speringer-verlag, ISBN 978-1-84996-286-5

Selected Publications (Sergei Chekanov):

1. Searches for TeV-scale particles at the LHC using jet substructure
   S.Chekanov, J.Proudfoot, Phys. Rev. D81 (2010) 114038

2. Measurements of underlying-event properties using neutral and charged particles in pp collisions at 900 GeV and 7 TeV with the ATLAS detector at the LHC (ATLAS collaboration). Eur.Phys.J. C71 (2011) 1636

3. Measurement of prompt photons with associated jets in photoproduction at HERA
   ZEUS Collab., Chekanov, S. and others, Eur. J. Phys C49 (2007) 511

4. Selection and reconstruction of the top quarks in the all- hadronic decays at a linear collider Chekanov, S. V. and Morgunov, V. L., Phys. Rev. D67 (2003) p. 074011

5. Bose-Einstein correlations and color reconnection in W pair production
   Chekanov, S. V., De Wolf, E. A., and Kittel, W., Eur. Phys. J. C6 (1999) p. 403-411

6. Generalized bunching parameters and multiplicity fluctuations in restricted phase-space bins, Chekanov, S. V., Kittel, W., and Kuvshinov, V. I. Z. Phys. C74 (1997) p. 517-529

7. Measurement of D*+- production in deep inelastic e+- p scattering at HERA
   ZEUS Collab., Chekanov, S. et.al, Phys. Rev. D69 (2004) 012004

8. Observation of the strange sea in the proton via inclusive Phi-meson production in neutral current deep inelastic scattering at HERA
   ZEUS Collab., Chekanov, S. et. al, Phys. Lett. B553 (2003) 141

Jack Cranshaw

High Energy Physics Division
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E-mail: cranshaw@anl.gov

Education:

PhD in Physics, Rice University, Houston, TX, 1995.
BS in Physics, Texas A&M University, College Station, TX, 1988.

Professional Employment:

Software Engineer	Argonne National Laboratory	2004-present
Senior Research Associate	Texas Tech University	2001-2004.
Research Associate	Texas Tech University	1998-2000.
Research Associate	INFN, Sezione Trieste	1995-1998.

Awards, Memberships, and Professional Service:

Member, American Physical Society.
Member, Association for Computing Machinery.
Publications (176) with 12,962 citations.
Unpublished technical reports (about 30).
COMPASS proposal to measure gluon spin component in the proton.
SMC service work (coordination and publication)
CDF service work (coordination and online software)
ATLAS service work (offline software)

Selected Research Accomplishments:

Trigger system for Fermilab experiment E704 forward spectrometer (1989-1990).
Measurements of large x_F analyzing power in p, L production using polarized protons (1991-1995).
Polarimeter tracking system for CERN experiment NA47 (SMC) (1990-1992).
First test of the validity of the Bjorken Sum Rule using polarized m-p DIS (1991-1995).
SMC muon beam polarization measurement using m-e elastic scattering (1992-1998).
Improved measurement of $B^+ \to XK^+$ branching ratio at CDF (2000-2003).
Calibration database system for online and offline for CDF Run II (1998-2004).
Observation of the decay $B_c^+ \to J/\psi\pi^+$ at CDF (2003-2006)
Streaming conditions and criteria for RAW data at ATLAS (2007).
Metadata services for grid-resident ATLAS data (2005-2011).

Selected Publications (Jack Cranshaw):

1. "The ATLAS TAGS database distribution and management: Operational challenges of a multi-terabyte distributed database", F. Viegas, et. al., J.Phys.Conf.Ser. 219 072058, 2010.

2. "Petaminer: Efficient Navigation to Petascale Data Using Event-Level Metadata", P. Hamill, J. Cranshaw, A. Vaniachine, D. Malon, PoS ACAT08 071, 2008.

3. "Evidence for the exclusive decay $B_c^+ \to J/\psi\ \pi^+$ and measurement of the mass of the B_c meson", CDF Collaboration, Phys Rev Lett 96 : 082002, 2006.

4. "Measurement of the SMC muon beam polarization using the asymmetry in the elastic scattering off polarized electrons", SMC Collaboration, Nucl.Instrum.Meth. A443, 2000.

5. "Spin asymmetries A_1 and structure functions g_1 of the proton and the deuteron from polarized high-energy muon scattering", SMC Collaboration, Phys.Rev.D 58, 1998.

6. "A Next-to-leading order QCD analysis of the spin structure function g(1)", SMC Collaboration, Phys.Rev.D 58: 112002, 1998.

7. "Analyzing power measurement in inclusive Λ^0 production with a 200-GeV/c polarized proton beam", Fermilab E704 Collaboration, Phys.Rev.Lett. 75, 1995.

8. "Analyzing power in inclusive π^+ and π^- production at high x_F with a 200-GeV/c polarized proton beam", Fermilab E704 Collaboration, Phys.Lett. B264, 1991.

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Education:

B.S.E.E., University of Wisconsin – Madison, 1982
M.S.E.E., University of Wisconsin – Madison, 1983

Professional Employment:

Senior Engineer, ANL (2008-)
Engineer, ANL (1997-2008)
Engineer, Fermilab (1983-1997)

Awards, Memberships, and Professional Service:

Member, IEEE (1994)
Argonne Pacesetter Award – June, 2007, June, 2011
Publications (20)
Additional published conference proceedings (29)
Unpublished technical reports (53)

Selected Research Accomplishments

Design Engineer, design and production of front-end electronics for the calorimeters of the CDF detector, Run I at Fermilab (1983-1989).
Design of custom integrated circuits (1994-1996).
Lead Project Engineer, design and production of front-end electronics for the Shower Maximum Detector for the CDF, Run II Upgrade at Fermilab (1995-1999).
Lead Project Engineer and Level 3 Manager, design and production of the readout instrumentation for the MINOS Near Detector at Fermilab (1999-2005).
Design of Cockroft-Walton photomultiplier base for the BCAL detector of the Zeus Experiment at DESY in Hamburg, Germany (1999-2000).
Design of a custom backplane for the Level 2 Trigger of the ATLAS Experiment at the LHC at CERN in Switzerland (2004-2005).
Development of beam monitoring electronics for the NuMI Beamline at Fermilab (2003-2005).
Telescope camera R&D for the TrICE Telescope at Argonne (2003-2006).
Lead System Engineer, design and production of readout instrumentation for Digital Hadron Detector R&D for CALICE (Detector R&D for the International Linear Collider) (2003-present).
Development of a 1-GHz Photon-Counting Custom Integrated Circuit for Ground-Based Air-Cherenkov Telescopes. (2005-2008).
Development of 1-Picosecond timing instrumentation for HEP applications (2005-present).
R&D on detector development using silicon photomultipliers (2006-2008).
Switching power supply support for the Barrel Calorimeter of the ATLAS Experiment at the LHC at CERN in Switzerland (2006-present).
Lead engineer, design of high-speed topological trigger for future telescope arrays for gamma-ray astronomy (2007-present).
Development of new switching power supplies for the upgrade of the Barrel Calorimeter of the ATLAS Experiment at the LHC at CERN in Switzerland (2008-present).
Development of new readout instrumentation for the upgrade of the Barrel Calorimeter of the ATLAS Experiment at the LHC at CERN in Switzerland (2008-present).

Selected Publications (Gary Drake):

1. "An Upgraded Front-End Switching Power Supply Design for the Atlas TileCal Detector of the LHC," *IEEE 2011 NSS Conf. Rec.*, 2011, 8 pages.

2. "Production and Commissioning of a Large Prototype Digital Hadron Calorimeter for Future Colliding Beam Experiments," *IEEE 2011 NSS Conf. Rec.*, 2011, 12 pages.

3. "A New High-Speed Pattern Recognition Trigger for Ground-Based Telescope Arrays Used in Gamma-Ray Astronomy," *IEEE 2008 NSS Conf. Rec.*, 2008, 8 pages.

4. "The MINOS Near Detector Front End Electronics *IEEE Trans. Nucl. Sci.*, vol. 53, 2006, pp. 1347-1355.

5. "DCAL: A Custom Integrated Circuit for Calorimetry at the International Linear Collider," *IEEE 2005 NSS Conf. Rec.*, 2005, 8 pages.

6. "The Shower Maximum Front-End Electronics for the CDF Upgrade," *IEEE Trans .Nucl. Sci.*, vol. 49, 2002, pp. 2567-2573.

7. "The Upgraded CDF Front End Electronics for Calorimetry," *IEEE Trans. Nucl. Sci.*, vol. 39, 1992, pp. 1281-1285.

8. "A Large Dynamic Range Charge Amplifier ADC for the Fermilab Collider Detector Facility," *IEEE Trans. Nucl. Sci.*, vol. 33, 1986, pp. 893-896.

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Fax: 630-252-5782
E-mail: lecompte@anl.gov

Education:

S.B., MIT (1985)
M.S., Northwestern (1989)
Ph.D., Northwestern (1992)

Professional Employment:

Physicist, ANL (2000- present)
Assistant Physicist, ANL (1995-2000)
Visiting Research Assistant Professor, University of Illinois, (1994-1995)
Postdoctoral Fellow, University of Illinois (1992-1994)

Awards, Memberships, and Professional Service:

APS DPF and DNP Member
CTEQ Member
DOE, NSF and International Review Panels
Fermilab Director's Review Panels
Publications (638) with 35,031 citations.
Additional published conference proceedings and technical reports (90)
Lecturer at various summer schools
LHC Theory Initiative Steering Committee

Selected Research Accomplishments:

Physics Coordinator of ATLAS (2009-2010)
Deputy Physics Coordinator of ATLAS (2009)
Physics Coordinator of STAR (1998)
CDF Run II Muon Project Leader
Convener of ATLAS, STAR and CDF Physics Working Groups
Limits on supersymmetric particle production at ATLAS
b-cross section measurements at CDF
Bs mixing measurement at CDF
First Top decay measurements (BF to Wb + FCNC)

Selected Publications (Thomas LeCompte):

1. "Observation of top quark production in antiproton-proton collisions"
   CDF Collaboration (F. Abe et al.). Phys.Rev.Lett. 74 (1995) 2626-2631.

2. "Search for flavor-changing neutral current decays of the top quark in proton-antiproton collisions at 1.8$ TeV."
   CDF Collaboration (F. Abe et al.). Phys.Rev.Lett. 80 (1998) 2525-2530.

3. "Measurement of the ratio of *b* quark production cross sections in antiproton-proton collisions at 630 and 1800 GeV"
   By CDF Collaboration (D. Acosta et al.). Phys.Rev. D66 (2002) 032002.

4. "Measurement of the J/ψ meson and *b*-hadron production cross sections in proton - antiproton collisions 1960$ GeV"
   CDF Collaboration (D. Acosta et al.). Phys.Rev. D71 (2005) 032001.

5. "Observation of B^0_s - anti-B^0_s Oscillations"
   CDF Collaboration (A. Abulencia et al.). Phys.Rev.Lett. 97 (2006) 242003.

6. "Search for New Particles in Two-Jet Final States in 7 TeV Proton-Proton Collisions with the ATLAS Detector at the LHC"
   ATLAS Collaboration (Georges Aad et al.). Phys.Rev.Lett. 105 (2010) 161801.

7. "Observation of a New χ_b State in Radiative Transitions to the Y(1S) and Y(2S) at ATLAS"
   ATLAS Collaboration (Georges Aad et al.) http://arxiv.org/abs/1112.5154

8. "Large Hadron Collider reach for supersymmetric models with compressed mass spectra"
   Thomas J. LeCompte, Stephen P. Martin. Phys.Rev. D84 (2011) 015004.

David Malon

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Education:

BA Mathematics, MS Applied Mathematics, PhD Applied Mathematics (stochastic processes), Northwestern University

Awards, Memberships, and Recent Professional Service:

Member, Editorial Board, Journal of Reliability, Quality, and Safety Engineering
Life Member, American Mathematical Society
Life Member, Association for Computing Machinery
Member, INFORMS (Institute for Operations Research and the Management Sciences)
Member, International Advisory Committee for the CHEP (Computing in High Energy and Nuclear Physics) series of conferences
Member, PhD thesis committee, University of Vienna Faculty of Computer Science, 2011
Referee for several journals, and regular reviewer of federal grant proposals

Selected Research Accomplishments:

Coordinator of ATLAS event store and I/O framework efforts since the software project's inception)
ATLAS metadata coordinator since 2010
ATLAS database coordinator during/managing transition from Objectivity/DB to ROOT-based (POOL) data storage
Convener of the effort leading to the first LHC-wide common software project (POOL)
Lead architect for unique ATLAS event store features, including navigational infrastructure, in-file metadata handling, and explicit state representation

Selected Publications (David Malon):

1. Event selection services in ATLAS *J. Phys.: Conf. Series* **219** 042007

2. Supporting high-performance I/O at the petascale: The event data store for ATLAS at the LHC, IEEE International Conference on Cluster Computing and Workshops 2010, pp.1-7, 20-24 Sept. 2010.

3. New developments in file-based infrastructure for ATLAS event selection, J. Phys.: Conf. Ser. **219** (2010) 032061

4. Explicit state representation and the ATLAS event data model: Theory and practice, J. Phys.: Conf. Ser. **119** (2008) 042024

5. An inconvenient truth: file-level metadata and in-file metadata caching in the (file-agnostic) ATLAS event store, J. Phys.: Conf. Ser. **119** (2008) 042022

6. Schema Evolution and the ATLAS event store, Computing in High Energy and Nuclear Physics (CHEP), 2006

7. A flexible, distributed event level metadata system for ATLAS *Proc. Computing in High Energy and Nuclear Physics 2006* (Mumbai: Macmillan) pp 316-9

8. The event data store and I/O framework for the ATLAS experiment at the Large Hadron Collider *IEEE Int. Conf. on Cluster Computing and Workshops 2009* 1

Lawrence Jay Nodulman

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Education:

University of Illinois, Urbana BS (1969), MS (1970), PhD (1973)

Professional Employment:

Postdoc, University of Illinois, Urbana (1973-1975)
Postdoc, Adjunct Assistant Professor, University of California, Los Angeles (1975-1978)
Argonne: Assistant Physicist (1979-1983), Physicist (1983-1998),
Senior Physicist (1998- present)
Visiting Scientist, SSCL 1990

Selected Research Accomplishments:

ZGS pion induced exclusive reactions (1970-3)
AGS neutrino induced neutral current studies (Columbia/Illinois/Rock.) (1973- 1975)
SPEAR e+e− experiments SP10 (antinucleons) and SP25 (DELCO) (1975- 1978)
Hadron colliders: CDF, SDC, Atlas (1979- present)
Online monitoring for SP25 and CDF (run <2)
Calorimeter specialist in CDF (central EM fabrication 1983- 1985) (SPL 2003-12)
SDC (calorimeter leader 1990- 1991), Atlas/tilecal (1992- present)
Disigned wire chambers for CDF central EM shower max (1980)
Missing E_t (1985- 1989) and electroweak physics leader in CDF
Lecturer, exp. EWK Physics, NATO Institute St. Croix (1998)
Thesis committees:
R. StDenis, W. Trischuk (Harvard), D. Saltzburg, M. Hohlmann (Chicago)
732+ publications, 26 published proceedings
Details http://www.hep.anl.gov/ljn/mecv.html

Awards, Memberships, and Professional Service:

APS, AAAS
User: FNAL, CERN
Co-PI for ANL/CDF 1987- present
Associate Division Director 1998- present
FNAL UEC (chair) 1999-2002
Currently CDF co-leader of Electroweak -> SM Physics

Selected Publications (Lawrence Nodulman):

1. "A New Measurement of the ω(784) Width," R. M. Brown et al., Phys. Lett. 42B (1972) 117.

2. "Single Pion Production in Neutrino and Antineutrino Reactions," W. Lee et al., Phys. Rev. Lett. 38 (1976) 202.

3. "Measurement of the Threshold Behavior of $\tau^+\tau^-$ Production in e^+e^- Annihilations," W. Bacino et al., Phys. Rev. Lett. 41 (1978) 13.

4. "The CDF Central Electromagnetic Calorimeter," L. Balka et al., Nucl. Instrum. Methods A267, (1988) 272.

5. "Measurement of W Boson Production in 1.8 TeV pp Collisions," F. Abe et al., (CDF), Phys. Rev. Lett. 62, (1989) 1005.

6. "Measurement of the W Boson Mass in 1.8 TeV pp Collisions," F. Abe et al. (CDF), Phys. Rev. D43, (1991) 2070.

7. "Evidence for Top Quark Production in pp Collisions at $\sqrt{s}$ = 1.8 TeV," F. Abe et al. (CDF), Phys. Rev. D50 (1994) 2296.

8. "Precise Measurement of the W Boson Mass with the CDF-II Detector," T. Aaltonen et al. (CDF), Phys. Rev. Lett. 108 (2012) 151803.

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Education:

B.Sc., Edinburgh University, 1975
D. Phil., Oxford University, 1978

Professional Employment:

Senior Scientist, ANL (2002- present)
Physicist, ANL (1988-2002)
Assistant Physicist, ANL (1983-1988)
Research Associate, Rutherford Appleton Laboratory (1978-1983)

Awards, Memberships, and Professional Service:

University of Chicago Distinguished Performance Award (2004)
ANL Exceptional Performance Award (1993)
Member, American Physical Society
DOE, NSF and BNL Review panels
Conference organization (7)
Publications (514) with about 31545 citations.
Unpublished technical reports (83)
ANL service committee work (POCHP, LDRD, Strategic Planning)
CDF Service work (convenerships, editorial boards, operations)
SDC Service work (Technical Coordination, Calorimeter Subsystem Manager)
ATLAS General Service work (convenership, editorial boards, energy reconstruction)
ATLAS Tile Calorimeter Service Work (installation and commissioning, monitoring, signal reconstruction)
Member, US LHC Users Organization Executive Committee, 2007-2008

Selected Research Accomplishments:

Construction and testing of CDF central EM calorimeter (1982-1986)
Lead and implemented the initial calibration plan and framework for CDF (1984-1990)
Developed the first non-isolated electron software trigger for CDF (1989-1994)
Carried out extensive simulation studies of calorimeter response to hadrons and jets (1990- present)
Co-convenor of the CDF electroweak physics group during the early physics program (1992-1993)
Associate Department Head, CDF Operations (2002-2003)
SDC (SSC) calorimeter design, technical notes and presentations (1990-1993)
SDC R&D for development of radiation hard plastic scintillator (1990-1993)
Co-PI, Compensating Scintillator Plate Calorimeter Subsystem Collaboration (1990-1993)
ATLAS Tile Calorimeter design, construction, testing and installation (1994-2006)
Co-lead final assembly of Tile Calorimeter in ATLAS cavern (2004-2006)
Group leader, Argonne ATLAS Group (2006- present)
Co-convener ATLAS Jet and Missing E_t Combined Performance Group (2007-2009)

Thesis Committees:

Belen Salvachua (Univ. of Valencia)
Brian Martin (Michigan State University)

Selected Publications (James Proudfoot):

1. Measurements of underlying event properties using neutral and charged particles in p-p collisions at 900 GeV and 7 TeV with the ATLAS detector at the LHC, EPJC 71 (2011) 1636

2. The ATLAS Experiment at the CERN Large Hadron Collider. By ATLAS Collaboration (G. Aad et al.). 2008. 437pp.Published in JINST 3:S08003, 2008.

3. Determination of the jet energy scale at the collider detector at Fermilab. A. Bhatti et al. FERMILAB-PUB-05-470, Nucl.Instrum.Meth.A566:375-412, 2006 (2) Observation of Top Quark Production in p anti-p Collisions with the Collider Detector at Fermilab, F. Abe et al., The CDF Collaboration, Phys. Rev. Lett. 74, 2626

4. Measurement of Bottom Quark Production Cross Section using Semi-Leptonic Decay Electrons in p-pbar Collisions at $\sqrt{s}$ = 1.8TeV, F. Abe et al., (CDF) Phys. Rev. Lett. 71, 500 (1995)

5. A Measurement of W Boson Production in 1.8 p-pbar Collisions, F. Abe et el., (CDF) Phys. Rev. Lett. 62, 1005 (1989)

6. Research and Development Results on Scintillating Tile Fiber Calorimetry for the CDF and SDC Detectors, P. de Barbaro et al., Nucl. Instr. Meth. A315, 317 (1992)

7. Measurement of R and Search for the Top Quark in e+e- Annihilation Between 39.8 and 45.2GeV, TASSo Collaboration, M Althoff *et al*., Phys Lett. 138B 441 (1984)

8. Production ratios for Hadrons Produced in Muon Proton Inelastic Scattering at 219GeV, J. Proudfoot et *al*., Phys Rev D24 2012 (1981)

Bob Stanek

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Education:

PhD Physics, March 1980, University of Illinois, Chicago, USA
BS Physics, June 1970, University of Illinois, Chicago, USA

Professional Employment:

1986-present	Physicist, High Energy Physics Division, Argonne National Laboratory
1983-1986	Assistant Physicist, High Energy Physics Division, Argonne National Laboratory
1980-1983	Post Doctoral Appointment, High Energy Physics Division, Argonne National Laboratory

Synergistic Activities:
ATLAS Tile Calorimeter Project Leader at CERN, 2005-2009
ATLAS Tile Calorimeter Testbeam Coordinator at CERN, 1999-2004

Selected Publications (Robert Stanek):

1. New Optical Link Technologies for HEP Experiments, P. DeLurgio et al; To be published in Proceedings of DPF 2011, Aug 2011.

2. Search for Heavy Long-Lived Charged Particles with the ATLAS detector in pp collisions at sqrt(s) = 7 TeV, The ATLAS Collaboration, G. Aad *et al*.; Phys.Lett.B703:428-446, 2011.

3. New Optical Technology for Low Mass Intelligent Trigger and Readout, D. Underwood et al.; JINST 5:C07011, 2010.

4. The ATLAS Experiment at the CERN Large Hadron Collider, The ATLAS Collaboration, G. Aad et al.; JINST 3 (2008) S08003.

5. Testbeam Studies of Production Modules of the ATLAS Tile Calorimeter, P. Adragna et al.; ATL-TILECAL-PUB-2009-002, Submitted to JINST.

6. Effects of ATLAS Tile Calorimeter Failures on Jets and Missing Transverse Energy Measurements, P. Mermod, G. Arabidze, D. Milstead, R. Stanek; ATL-TILECAL-PUB-2008-011-1.

Peter van Gemmeren

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Education:

Diploma (Masters) of Physics, University of Siegen, Siegen, Germany 1995
Ph.D., Physics, Johannes Gutenberg University, Mainz, Germany 1998

Professional Employment:

Software Engineer, ANL (2005-present)
Senior Software Applications Engineer, BNL (2003-2005)
Member of Technical Staff, Lucent (2000-2003)
Postdoctoral Fellow, FNAL (1998-2000)

Awards, Memberships, and Professional Service:

Publications (461) with 27441 citations
D.O.E. Review panels (2 SBIR reviews)
ATLAS service work (software validation)

Selected Research Accomplishments:

Recognized as the lead developer for Athena I/O infrastructure
Successfully developed and deployed an in-file metadata support infrastructure
Contributed to design and of an intermediate state representation
Integrated persistency framework (POOL) into ATLAS core software for event store data
Designed and Implemented “Back Navigation” feature
Authored and implemented “C++ Coding Standards” for Lucent wireless network unit
Featured engineer for “Software Update Automation”
Led group responsible for design and prototyping of D0 silicon detector (F-disks)

Selected Publications (Peter van Gemmeren):

1. Persistent Data Layout and Infrastructure for Efficient Selective Retrieval of Event Data in ATLAS, presented at Meeting of the Division of Particles and Fields of the American Physical Society (2011)

2. Supporting high-performance I/O at the petascale: The event data store for ATLAS at the LHC, IEEE International Conference on Cluster Computing and Workshops 2010, pp.1-7, 20-24 Sept. 2010, doi: 10.1109/CLUSTERWKSP.2010.5613100

3. New developments in file-based infrastructure for ATLAS event selection, J. Phys.: Conf. Ser. 219 (2010) 032061

4. Event metadata records as a testbed for scalable data mining, J. Phys.: Conf. Ser. 219 (2010) 042057

5. The event data store and I/O framework for the ATLAS experiment at the Large Hadron Collider, IEEE International Conference on Cluster Computing and Workshops 2009, pp.1-8, Aug. 31 2009-Sept. 4 2009, doi: 10.1109/CLUSTR.2009.5289147.

6. Explicit state representation and the ATLAS event data model: Theory and practice, J. Phys.: Conf. Ser. 119 (2008) 042024 (10pp)

7. An inconvenient truth: file-level metadata and in-file metadata caching in the (file-agnostic) ATLAS event store, J. Phys.: Conf. Ser. 119 (2008) 042022 (7pp)

8. Schema Evolution and the ATLAS event store, Computing in High Energy and Nuclear Physics (CHEP), 2006

Alexandre Vaniachine

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CERN: +41 76 487 1934
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Education:

M.S., Moscow Engineering Physics Institute, 1977
Ph.D., Moscow Engineering Physics Institute, 1981

Professional Employment:

2001-present	Software Engineer/Computer Scientist, Argonne National Laboratory
1989–2001	Guest/visitor appointments at CERN, SSCL, BNL, LBNL and KTH, Stockholm
1990–1991	Postdoctoral Research Associate, University of Pittsburgh
1980–2001	Research Associate, Moscow Engineering Physics Institute

Awards, Memberships, and Professional Service:

- Member, Planning Group for U.S. ATLAS Computing R&D proposals, 2011-
- Member, ATLAS Computing Management Board (2006-2010)
- Coordinator, ATLAS Database Services/Operations (2004-2010)
- Talks on behalf of ATLAS Collaboration (IEEE NSS/MIC 2011, NEC2007 and ACAT02)
- Invited talks at international conferences and workshops (12 since 2007)
- Talk at ATLAS Weekly Meeting, 2011; plenary talk at ATLAS Overview Week, 2007, two plenary talks at ATLAS Software and Computing Workshops
- Member, Advisory Committee, International Conference on Distributed Computing and Grid Technologies in Science and Education, 2008-
- Convener, International Conference on Computing in High Energy and Nuclear Physics, 2007
- Panelist, Plenary Session, WLCG Collaboration Workshop, 2007
- Member, Program Committee, International Symposium on Nuclear Electronics and Computing, 2005-
- Reviewer, *IEEE TNS*, *J Physics*, *J Inst* and proposals for funding (SBIR, LDRD, etc)
- PI and co-PI of three R&D projects on database technologies for Grid computing (2005-2008)
- Fellow, Royal Swedish Academy of Sciences, Stockholm, Sweden, 1995
- Publications (175) with 2983 citations

Selected Research Accomplishments:

2011	Led to completion reprocessing of more than petabyte of ATLAS data on the Grid
2009	Solved database access problem that blocked ATLAS data reprocessing on the Grid
2006	Pioneered applications of Virtual Machines for HEP computing
2005	Proposed data replication technology for scalable database access on the Grid
2003	Developed database software for ATLAS detector description parameters
2002	Introduced data transformation concept that was adopted for ATLAS data processing
2001	Published the paper on pioneering use of a novel approach for high-throughput computing, which is now adopted by all LHC experiments as “pilot” jobs

Selected Publications (Alexandre Vaniachine):

1. ATLAS detector data processing on the Grid
   Vaniachine A V for the ATLAS Collaboration
   2011 *IEEE Nuclear Science Symposium and Medical Imaging Conference*, p. 104
2. Scaling up ATLAS Database Release Technology for the LHC Long Run
   Borodin M, Nevski P and Vaniachine A for the ATLAS Collaboration
   2011 *J. Phys.: Conf. Ser.* **331** 042004.
3. Petaminer: Efficient navigation to petascale data using event-level metadata
   Hamill P, Cranshaw J, Malon D, and Vaniachine A
   2008 *PoS ACAT08*, 071.
4. Development, deployment and operations of ATLAS databases
   Vaniachine A and von der Schmitt J
   2008, *J. Phys. Conf. Ser*. **119** 072031.
5. Advanced Technologies for Distributed Database Services Hyperinfrastructure
   Vaniachine A, Malon D and Vranicar M
   2005, *Int. J. of Mod. Phys.* A **20** (16):3877.
6. Primary Numbers Database for ATLAS Detector Description Parameters
   Vaniachine A, Eckmann S, Malon D, Nevski P, and Wenaus T
   2003, *Computing in High Energy and Nuclear Physics (CHEP03): Proc. of the Int. Conf. –* eConf C030324, MOKT006.
7. Data Challenges in ATLAS Computing
   Vaniachine A for the ATLAS collaboration
   2003, *Nucl. Instrum. Meth.* A**502**:446.
8. Bilevel Architecture for High-Throughput Computing
   Nevski P, Vaniachine A and Wenaus T
   2001 *Computing in High Energy and Nuclear Physics (CHEP 2001): Proc. of the Int. Conf.*, Beijing, China, p. 696.

Rik Yoshida

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Education:

BA, Northwestern University (1981)
PhD, Northwestern University (1990)

Professional Employment:

Physicist, ANL (2005- present)
Assistant Physicist, ANL (1996-2005)
Research Associate, University of Bristol, UK (1993-1996)
Research Associate, NIKHEF, Amsterdam (1990-1993)

Awards, Memberships, and Professional Service:

APS Fellow (2011)
Spokesman ZEUS experiment (2003-2005)
Deputy Spokesman ZEUS experiment (1999-2001)
Member ATLAS Publication Committee (2011- present)
US ATLAS Analysis Support Manager (2011-2012)
US ATLAS Tier3 Coordinator (2009-2010)
Member LHCC (2005-2009)
Member ZEUS editorial panel (2006- present)
Founding member HERA-LHC workshop committee (2004-2006)
Member International Advisory Committee, International Conference on Calorimetry in HEP (1997-2011)
Coordinator ZEUS structure function and electroweak group (1999)
Coordinator ZEUS calorimeter group (1995-1999)
Coordinator ZEUS monte carlo group (1993-1994)

Selected Research Accomplishments:

Construction and operation of Fermilab experiment 687 (1985-1990)
Construction and commissioning of the ZEUS Forward and Rear Calorimeter (1990-1993).
Commissioning of ZEUS monte carlo production system (1993- present).
Proton Structure Function analysis, main author electron analysis (1994).
Analysis team leader, Structure Function Measurement (1996-1997, 1999),
ZEUS energy calibration strategy (1993-2005).
Lead ZEUS through post-upgrade commissioning (2003).
Lead ZEUS through HERA beam background issues (2003-2004).
36 publications from ZEUS under spokesmanship. (2003-2005).
Argonne ATLAS Analysis Support Center development and management (2007-2012).
US ATLAS Tier3 design, development and deployment (2009-2010).
US ATLAS Analysis Support planning and management (2011-2012).
Publications (340) with 17000 citations.

Selected Publications (Rik Yoshida):

1. Search for SM Higgs in the Diphoton Decay Channel (ATLAS), Phys. Rev. Lett. 108 (2012) 111803

2. Measurement of Underlying Events using Neutral and Charged Particles (ATLAS), Eur. Phys. J. C71 (2011) 1636.

3. Combined Measurements and QCD Analysis of ep Scattering Cross Sections at HERA (H1 and ZEUS) JHEP 1001:109, 2010.

4. Collider Physics at HERA (75 pp.) (M. Klein and RY) Prog. Part. Nucl. Phys. 61 (2008) 343.

5. High-Q2 DIS with Polarized Positron Beam, (ZEUS) PLB 637 (2006) 210.

6. NLO QCD Analysis of DIS and Jet data, (ZEUS) EPJC 42 (2005) 1.

7. Search for CI, Extra-dim, and Finite Quark-radius, (ZEUS) PLB 591, (2004) 23.

8. Proton Structure Function F2, (ZEUS) EPJC 21 (2001) 443.

Jinlong Zhang

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(currently at CERN)
E-Mail: zhangjl@anl.gov

Education:

Ph.D., Colorado Sate University 2002
M.S. in physics, Institute of High Energy Physics, China, 1997
B.S. in physics, Shanxi University, China, 1994

Professional Employment:

Assistant Physicist, ANL (2006- present)
Research Associate, University of Colorado (2004-2006)
Research Associate, MIT (2002-2004)

Awards, Memberships, and Professional Service:

ATLAS run manager
ATLAS MinBias trigger signature deputy convener
ATLAS DAQ/HLT coordination
ILC FCAL institution board
BABAR run coordination

Selected Research Accomplishments

ATLAS FTK project (2008- present)
ATLAS physics analysis (QCD, Higgs search) (2009- present)
ATLAS trigger and detector performance study (2008- present)
ATLAS TDAQ commissioning and operation (2006- present)
ILC very forward region calorimeter R&D (2004- present)
BABAR DCH electronics upgrade (2004-2006)
BABAR muon detector upgrade (2004-2006)
CP angle gamma measurement with Dalitz analysis at BABAR (2004-2007)
PHOBOS data analysis tools (2002-2004)
Initiated hybrid/glueball search at BABAR (1998-2006)

Selected Publications (Jinlong Zhang):

1. A. Andreani et al., "The FastTracker Real Time Processor and Its Impact on Muon Isolation, Tau and b-Jet Online Selections at ATLAS", IEEE Trans. Nucl. Sci. 59, 348 (2012).

2. ATLAS Collaboration, "Combined search for the Standard Model Higgs boson using up to 4.9 fb^{-1} of pp collision data at $\sqrt{s}$ = 7 TeV with the ATLAS detector at the LHC", Phys. Lett. B710 (2012) 49-66.

3. ATLAS Collaboration, "Measurements of underlying event properties using neutral and charged particles in p-p collisions at 900 GeV and 7 TeV with the ATLAS detector at the LHC", EPJC 71, 1636 (2011).

4. ATLAS Collaboration, "Charged-particle multiplicities in pp interactions at $\sqrt{s}$ = 900 GeV measured with the ATLAS detector at the LHC", Phys. Lett. B688, 21 (2010).

5. H. Abramowicz et al., "Forward Instrumentation for ILC Detectors", JINST 5, P12002 (2010).

6. BABAR Collaboration, "Measurement of CP Violation Parameters with a Dalitz Plot Analysis of $B^{\pm} \rightarrow D\, \pi^{+}\, \pi^{-}\, \pi^{0}\, K^{\pm}$", Phys. Rev. Lett. 99, 251801 (2007).

7. PHOBOS Collaboration, "The PHOBOS perspective on discoveries at RHIC", Nucl. Phys. A 757, 28 (2005).

8. BABAR Collaboration, "Rare B Decays into States Containing a J/psi Meson and a Meson with ssbar Quark Content", Phys. Rev. Lett. 91, 071801 (2003).

11. APPENDIX G: Personnel and Funding Tables

(All numbers are in K$)

DOE Support FY 2011 (Actual)						
Personnel Support from DOE:	ATLAS		CMS		TOTAL	
	No. heads	FTE	No. heads	FTE	No. heads	FTE
Permanent PhD	10	7.10	0	0.00	**10**	**7.10**
Temporary PhD	3	2.10	0	0.00	**3**	**2.10**
Graduate Students	1	0.40	0	0.00	**1**	**0.40**
Engineer	2	1.65	0	0.00	**2**	**1.65**
Computing Professional	5	5.00	0	0.00	**5**	**5.00**
Technician	1	0.50	0	0.00	**1**	**0.50**
Administrative	1	0.42	0	0.00	**1**	**0.42**
TOTAL	23	17.17	0	0.00	**23**	**17.17**
DOE/HEP Funding (per activity):						
SWF (in K$, include overhead)		$4,349		$0		**$4,349**
M&S (in K$, include overhead)		$441		$0		**$441**
Travel (in K$, include overhead)		$411		$0		**$411**
TOTAL		**$5,202**		**$0**		**$5,202**

DOE Support FY 2012 (Actual)						
Personnel Support from DOE:	ATLAS		CMS		TOTAL	
	No. heads	FTE	No. heads	FTE	No. heads	FTE
Permanent PhD	10	7.90	0	0.00	**10**	**7.90**
Temporary PhD	5	3.50	0	0.00	**5**	**3.50**
Graduate Students	3	2.00	0	0.00	**3**	**2.00**
Engineer	7	3.25	0	0.00	**7**	**3.25**
Computing Professional	5	5.00	0	0.00	**5**	**5.00**
Technician	1	0.50	0	0.00	**1**	**0.50**
Administrative	1	0.76	0	0.00	**1**	**0.76**
TOTAL	32	22.91	0	0.00	**32**	**22.91**
DOE/HEP Funding (per activity):						
SWF (in K$, include overhead)		$5,065		$0		**$5,065**
M&S (in K$, include overhead)		$401		$0		**$401**
Travel (in K$, include overhead)		$343		$0		**$343**
TOTAL		**$5,808**		**$0**		**$5,808**

(All numbers are in K$)

DOE Support FY 2013 (Proposed)						
Personnel Support from DOE:	**ATLAS**		**CMS**		**TOTAL**	
	No. heads	**FTE**	**No. heads**	**FTE**	**No. heads**	**FTE**
Permanent PhD	10	8.30	0	0.00	**10**	**8.30**
Temporary PhD	5	4.60	0	0.00	**5**	**4.60**
Graduate Students	4	2.00	0	0.00	**4**	**2.00**
Engineer	6	2.76	0	0.00	**6**	**2.76**
Computing Professional	5	4.50	0	0.00	**5**	**4.50**
Technician	1	0.50	0	0.00	**1**	**0.50**
Administrative	1	0.76	0	0.00	**1**	**0.76**
TOTAL	32	23.42	0	0.00	**32**	**23.42**
DOE/HEP Funding (per activity):						
SWF (in K$, include overhead)		$5,243		$0		**$5,243**
M&S (in K$, include overhead)		$350		$0		**$350**
Travel (in K$, include overhead)		$429		$0		**$429**
TOTAL		**$6,022**		**$0**		**$6,022**

DOE Support FY 2014 (Proposed)						
Personnel Support from DOE:	**ATLAS**		**CMS**		**TOTAL**	
	No. heads	**FTE**	**No. heads**	**FTE**	**No. heads**	**FTE**
Permanent PhD	10	8.50	0	0.00	**10**	**8.50**
Temporary PhD	4	4.00	0	0.00	**4**	**4.00**
Graduate Students	4	2.00	0	0.00	**4**	**2.00**
Engineer	6	2.55	0	0.00	**6**	**2.55**
Computing Professional	5	4.50	0	0.00	**5**	**4.50**
Technician	1	1.00	0	0.00	**1**	**1.00**
Administrative	1	0.26	0	0.00	**1**	**0.26**
TOTAL	31	22.81	0	0.00	**31**	**22.81**
DOE/HEP Funding (per activity):						
SWF (in K$, include overhead)		$5,410		$0		**$5,410**
M&S (in K$, include overhead)		$258		$0		**$258**
Travel (in K$, include overhead)		$492		$0		**$492**
TOTAL		**$6,161**		**$0**		**$6,161**

(All numbers are in K$)

DOE Support FY 2015 (Proposed)						
Personnel Support from DOE:	**ATLAS**		**CMS**		**TOTAL**	
	No. heads	**FTE**	**No. heads**	**FTE**	**No. heads**	**FTE**
Permanent PhD	10	8.50	0	0.00	**10**	**8.50**
Temporary PhD	4	4.00	0	0.00	**4**	**4.00**
Graduate Students	3	2.00	0	0.00	**3**	**2.00**
Engineer	6	2.55	0	0.00	**6**	**2.55**
Computing Professional	5	4.50	0	0.00	**5**	**4.50**
Technician	1	0.50	0	0.00	**1**	**0.50**
Administrative	1	0.76	0	0.00	**1**	**0.76**
TOTAL	30	22.81	0	0.00	**30**	**22.81**
DOE/HEP Funding (per activity):	-					
SWF (in K$, include overhead)		$5,502		$0		**$5,502**
M&S (in K$, include overhead)		$268		$0		**$268**
Travel (in K$, include overhead)		$331		$0		**$331**
TOTAL		**$6,101**		**$0**		**$6,101**

(All numbers are in K$)

DOE Support FY 2011 (Actual)						
Personnel Support from DOE:	CDF		D0		TOTAL	
	No. heads	FTE	No. heads	FTE	No. heads	FTE
Permanent PhD	2	1.82	0	0.00	**2**	**1.82**
Temporary PhD	0	0.00	0	0.00	**0**	**0.00**
Graduate Students	0	0.00	0	0.00	**0**	**0.00**
Engineer	0	0.00	0	0.00	**0**	**0.00**
Computing Professional	0	0.00	0	0.00	**0**	**0.00**
Technician	0	0.00	0	0.00	**0**	**0.00**
Administrative	1	0.02	0	0.00	**1**	**0.02**
TOTAL	3	1.84	0	0.00	**3**	**1.84**
DOE/HEP Funding (per activity):	-					
SWF (in K$, include overhead)		$577		$0		**$577**
M&S (in K$, include overhead)		$0		$0		**$0**
Travel (in K$, include overhead)		$0		$0		**$0**
TOTAL		**$577**		**$0**		**$577**

DOE Support FY 2012 (Actual)						
Personnel Support from DOE:	CDF		D0		TOTAL	
	No. heads	FTE	No. heads	FTE	No. heads	FTE
Permanent PhD	1	0.50	0	0.00	**1**	**0.50**
Temporary PhD	0	0.00	0	0.00	**0**	**0.00**
Graduate Students	0	0.00	0	0.00	**0**	**0.00**
Engineer	0	0.00	0	0.00	**0**	**0.00**
Computing Professional	0	0.00	0	0.00	**0**	**0.00**
Technician	0	0.00	0	0.00	**0**	**0.00**
Administrative	0	0.00	0	0.00	**0**	**0.00**
TOTAL	1	0.50	0	0.00	**1**	**0.50**
DOE/HEP Funding (per activity):	-					
SWF (in K$, include overhead)		$142		$0		**$142**
M&S (in K$, include overhead)		$30		$0		**$30**
Travel (in K$, include overhead)		$5		$0		**$5**
TOTAL		**$177**		**$0**		**$177**

(All numbers are in K$)

DOE Support FY 2013 (Proposed)						
Personnel Support from DOE:	**CDF**		**D0**		**TOTAL**	
	No. heads	**FTE**	**No. heads**	**FTE**	**No. heads**	**FTE**
Permanent PhD	0	0.00	0	0.00	**0**	**0.00**
Temporary PhD	0	0.00	0	0.00	**0**	**0.00**
Graduate Students	0	0.00	0	0.00	**0**	**0.00**
Engineer	0	0.00	0	0.00	**0**	**0.00**
Computing Professional	0	0.00	0	0.00	**0**	**0.00**
Technician	0	0.00	0	0.00	**0**	**0.00**
Administrative	0	0.00	0	0.00	**0**	**0.00**
TOTAL	0	0.00	0	0.00	**0**	**0.00**
DOE/HEP Funding (per activity):	-					
SWF (in K$, include overhead)		$0		$0		**$0**
M&S (in K$, include overhead)		$0		$0		**$0**
Travel (in K$, include overhead)		$0		$0		**$0**
TOTAL		**$0**		**$0**		**$0**

DOE Support FY 2014 (Proposed)						
Personnel Support from DOE:	**CDF**		**D0**		**TOTAL**	
	No. heads	**FTE**	**No. heads**	**FTE**	**No. heads**	**FTE**
Permanent PhD	0	0.00	0	0.00	**0**	**0.00**
Temporary PhD	0	0.00	0	0.00	**0**	**0.00**
Graduate Students	0	0.00	0	0.00	**0**	**0.00**
Engineer	0	0.00	0	0.00	**0**	**0.00**
Computing Professional	0	0.00	0	0.00	**0**	**0.00**
Technician	0	0.00	0	0.00	**0**	**0.00**
Administrative	0	0.00	0	0.00	**0**	**0.00**
TOTAL	0	0.00	0	0.00	**0**	**0.00**
DOE/HEP Funding (per activity):	-					
SWF (in K$, include overhead)		$0		$0		**$0**
M&S (in K$, include overhead)		$0		$0		**$0**
Travel (in K$, include overhead)		$0		$0		**$0**
TOTAL		**$0**		**$0**		**$0**

(All numbers are in K$)

DOE Support FY 2015 (Proposed)						
Personnel Support from DOE:	**CDF**		**D0**		**TOTAL**	
	No. heads	**FTE**	**No. heads**	**FTE**	**No. heads**	**FTE**
Permanent PhD	0	0.00	0	0.00	**0**	**0.00**
Temporary PhD	0	0.00	0	0.00	**0**	**0.00**
Graduate Students	0	0.00	0	0.00	**0**	**0.00**
Engineer	0	0.00	0	0.00	**0**	**0.00**
Computing Professional	0	0.00	0	0.00	**0**	**0.00**
Technician	0	0.00	0	0.00	**0**	**0.00**
Administrative	0	0.00	0	0.00	**0**	**0.00**
TOTAL	0	0.00	0	0.00	**0**	**0.00**
DOE/HEP Funding (per activity):						
SWF (in K$, include overhead)		$0		$0		**$0**
M&S (in K$, include overhead)		$0		$0		**$0**
Travel (in K$, include overhead)		$0		$0		**$0**
TOTAL		**$0**		**$0**		**$0**

(All numbers are in K$)

DOE Support FY 2011 (Actual)						
Personnel Support from DOE:	**LHC (ATLAS/CMS)**		**Tevatron (D0/CDF)**		**TOTAL**	
	No. heads	**FTE**	**No. heads**	**FTE**	**No. heads**	**FTE**
Permanent PhD	10	7.10	2	1.82	**12.00**	**8.92**
Temporary PhD	3	2.10	0	0.00	**3.00**	**2.10**
Graduate Students	1	0.40	0	0.00	**1.00**	**0.40**
Engineer	2	1.65	0	0.00	**2.00**	**1.65**
Computing Professional	5	5.00	0	0.00	**5.00**	**5.00**
Technician	1	0.50	0	0.00	**1.00**	**0.50**
Administrative	1	0.42	1	0.02	**2.00**	**0.44**
TOTAL	23	17.17	3	1.84	**26**	**19.01**
DOE/HEP Funding (per activity):	-					
SWF (in K$, include overhead)		$4,349		$577		**$4,926**
M&S (in K$, include overhead)		$441		$0		**$441**
Travel (in K$, include overhead)		$411		$0		**$411**
TOTAL		**$5,202**		**$577**		**$5,779**

DOE Support FY 2012 (Actual)						
Personnel Support from DOE:	**LHC (ATLAS/CMS)**		**Tevatron (D0/CDF)**		**TOTAL**	
	No. heads	**FTE**	**No. heads**	**FTE**	**No. heads**	**FTE**
Permanent PhD	10	7.90	1	0.50	**11.00**	**8.40**
Temporary PhD	5	3.50	0	0.00	**5.00**	**3.50**
Graduate Students	3	2.00	0	0.00	**3.00**	**2.00**
Engineer	7	3.25	0	0.00	**7.00**	**3.25**
Computing Professional	5	5.00	0	0.00	**5.00**	**5.00**
Technician	1	0.50	0	0.00	**1.00**	**0.50**
Administrative	1	0.50	0	0.00	**1.00**	**0.50**
TOTAL	32	22.65	1	0.50	**33**	**23.15**
DOE/HEP Funding (per activity):	-					
SWF (in K$, include overhead)		$5,065		$142		**$5,207**
M&S (in K$, include overhead)		$401		$30		**$431**
Travel (in K$, include overhead)		$343		$5		**$348**
TOTAL		**$5,808**		**$177**		**$5,985**

(All numbers are in K$)

DOE Support FY 2013 (Proposed)						
Personnel Support from DOE:	**LHC (ATLAS/CMS)**		**Tevatron (D0/CDF)**		**TOTAL**	
	No. heads	**FTE**	**No. heads**	**FTE**	**No. heads**	**FTE**
Permanent PhD	10	8.30	0	0.00	**10.00**	**8.30**
Temporary PhD	5	4.60	0	0.00	**5.00**	**4.60**
Graduate Students	4	2.00	0	0.00	**4.00**	**2.00**
Engineer	6	2.76	0	0.00	**6.00**	**2.76**
Computing Professional	5	4.50	0	0.00	**5.00**	**4.50**
Technician	1	0.50	0	0.00	**1.00**	**0.50**
Administrative	1	0.50	0	0.00	**1.00**	**0.50**
TOTAL	32	23.16	0	0.00	**32.0**	**23.16**
DOE/HEP Funding (per activity):						
SWF (in K$, include overhead)		$5,243		$0		**$5,243**
M&S (in K$, include overhead)		$350		$0		**$350**
Travel (in K$, include overhead)		$429		$0		**$429**
TOTAL		**$6,022**		**$0**		**$6,022**

DOE Support FY 2014 (Proposed)						
Personnel Support from DOE:	**LHC (ATLAS/CMS)**		**Tevatron (D0/CDF)**		**TOTAL**	
	No. heads	**FTE**	**No. heads**	**FTE**	**No. heads**	**FTE**
Permanent PhD	10	8.50	0	0.00	**10.00**	**8.50**
Temporary PhD	4	4.00	0	0.00	**4.00**	**4.00**
Graduate Students	4	2.00	0	0.00	**4.00**	**2.00**
Engineer	6	2.55	0	0.00	**6.00**	**2.55**
Computing Professional	5	4.50	0	0.00	**5.00**	**4.50**
Technician	1	1.00	0	0.00	**1.00**	**1.00**
Administrative	1	1.00	0	0.00	**1.00**	**1.00**
TOTAL	31	23.55	0	0.00	**31**	**23.55**
DOE/HEP Funding (per activity):						
SWF (in K$, include overhead)		$5,410		$0		**$5,410**
M&S (in K$, include overhead)		$258		$0		**$258**
Travel (in K$, include overhead)		$492		$0		**$492**
TOTAL		**$6,161**		**$0**		**$6,161**

(All numbers are in K$)

DOE Support FY 2015 (Proposed)						
Personnel Support from DOE:	**LHC (ATLAS/CMS)**		**Tevatron (D0/CDF)**		**TOTAL**	
	No. heads	**FTE**	**No. heads**	**FTE**	**No. heads**	**FTE**
Permanent PhD	10	8.50	0	0.00	**10.00**	**8.50**
Temporary PhD	4	4.00	0	0.00	**4.00**	**4.00**
Graduate Students	3	2.00	0	0.00	**3.00**	**2.00**
Engineer	6	2.55	0	0.00	**6.00**	**2.55**
Computing Professional	5	4.50	0	0.00	**5.00**	**4.50**
Technician	1	0.50	0	0.00	**1.00**	**0.50**
Administrative	1	0.50	0	0.00	**1.00**	**0.50**
TOTAL	30	22.55	0	0.00	**30**	**22.55**
DOE/HEP Funding (per activity):						
SWF (in K$, include overhead)		$5,502		$0		**$5,502**
M&S (in K$, include overhead)		$268		$0		**$268**
Travel (in K$, include overhead)		$331		$0		**$331**
TOTAL		**$6,101**		**$0**		**$6,101**