

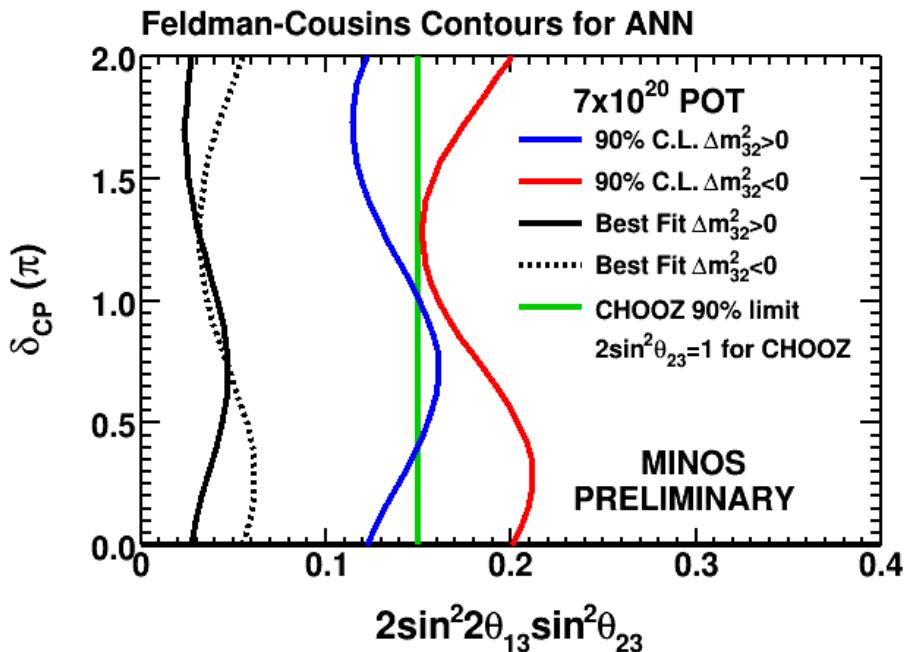
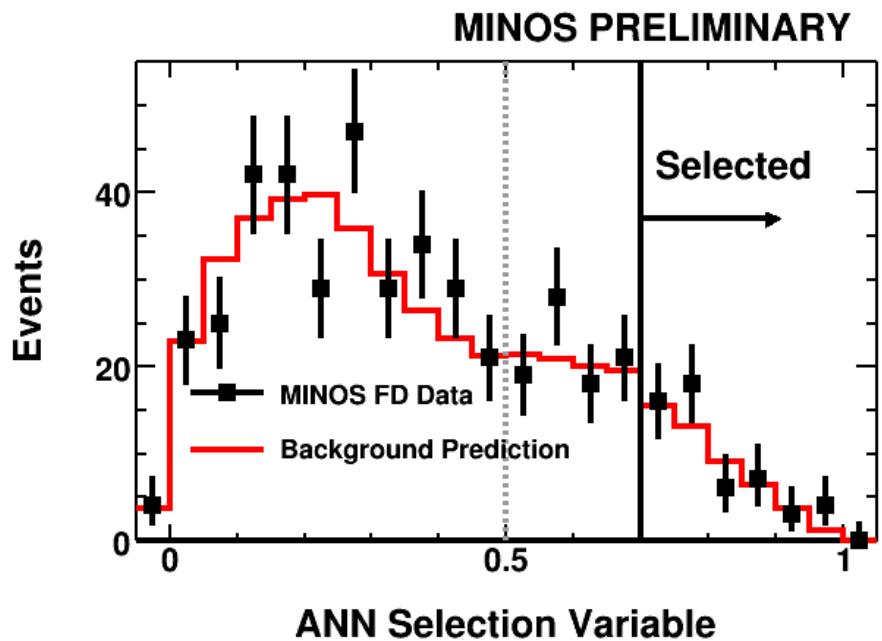
MINOS Sensitivity to θ_{13}

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ANL

(for the MINOS collaboration)

Latest MINOS θ_{13} Analysis Result $(7 \times 10^{20} \text{ POT})$



Expected Background:
 $49.1 \pm 7.0(\text{stat.}) \pm 2.7(\text{syst.})$.

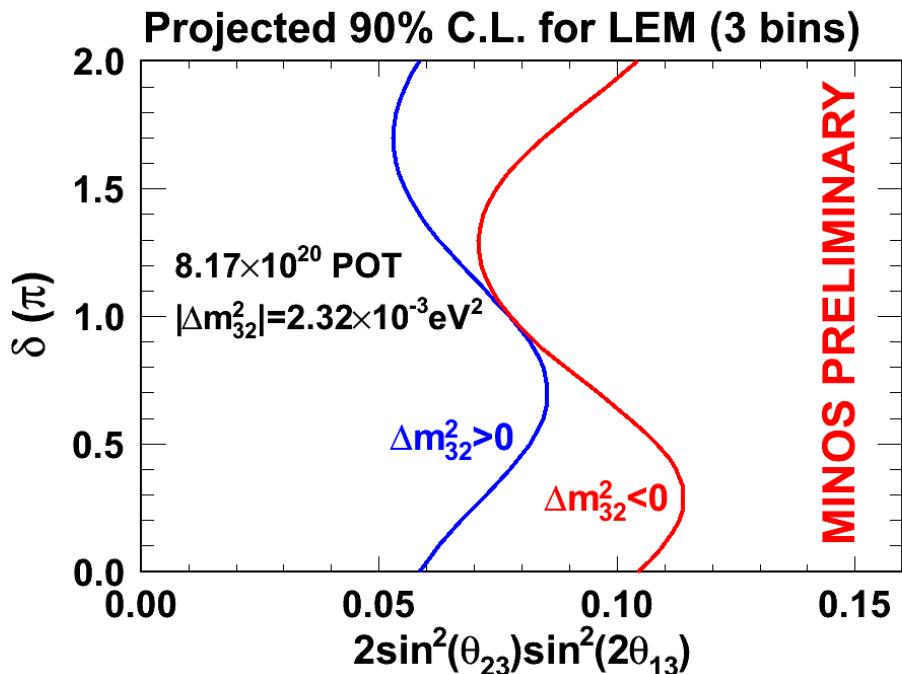
Observe 54 events. (0.7σ excess)

At $\delta = 0$ and $2\sin^2(\theta_{23}) = 1$, the 90% C.L. limit
 $\sin^2(2\theta_{13}) < 0.12$ (normal hierarchy)
 $\sin^2(2\theta_{13}) < 0.20$ (inverted hierarchy)

Current MINOS θ_{13} Analysis

The new analysis will have 30% better sensitivity than previous analysis:

- ◆ More data: 7.01×10^{20} POT $\Rightarrow 8.17 \times 10^{20}$ POT
- ◆ New PID: ANN11 \Rightarrow Library Event Matching (LEM)
- ◆ New Extrapolation method: one PID and energy bin \Rightarrow multi PID and energy bins



With the improved analysis technique,
the sensitivity will be improve by

- ◆ 24% using 7.01×10^{20} POT data.
- ◆ 30% using 8.17×10^{20} POT data.

For $\theta_{13} = 0$, our expectation is
 $49.4 \pm 7.0(\text{stat}) \pm 2.7(\text{syst})$.

Extra slide

Improvement of the Analysis Technique

