Paper status

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Papers in progress

http://www.icrr.u-tokyo.ac.jp/~kohki/tmp/drafts/ (id: kohki, pw: drafts)

1. **SN Ia host galaxies (09Konishi_d.pdf)**
   - 56Ni mass and Hubble residual

2. **Subaru spectroscopy (09Konishi_a.pdf)**
   - Data, Reduction, Galaxy subtraction

3. **Line profiles (09Konishi_b.pdf)**
   - Temporal and Redshift evolution of lines

4. **Correlation between Luminosity and EWs (09Konishi_c.pdf)**
   - Spectral luminosity indicator

1st: SN Ia host galaxies

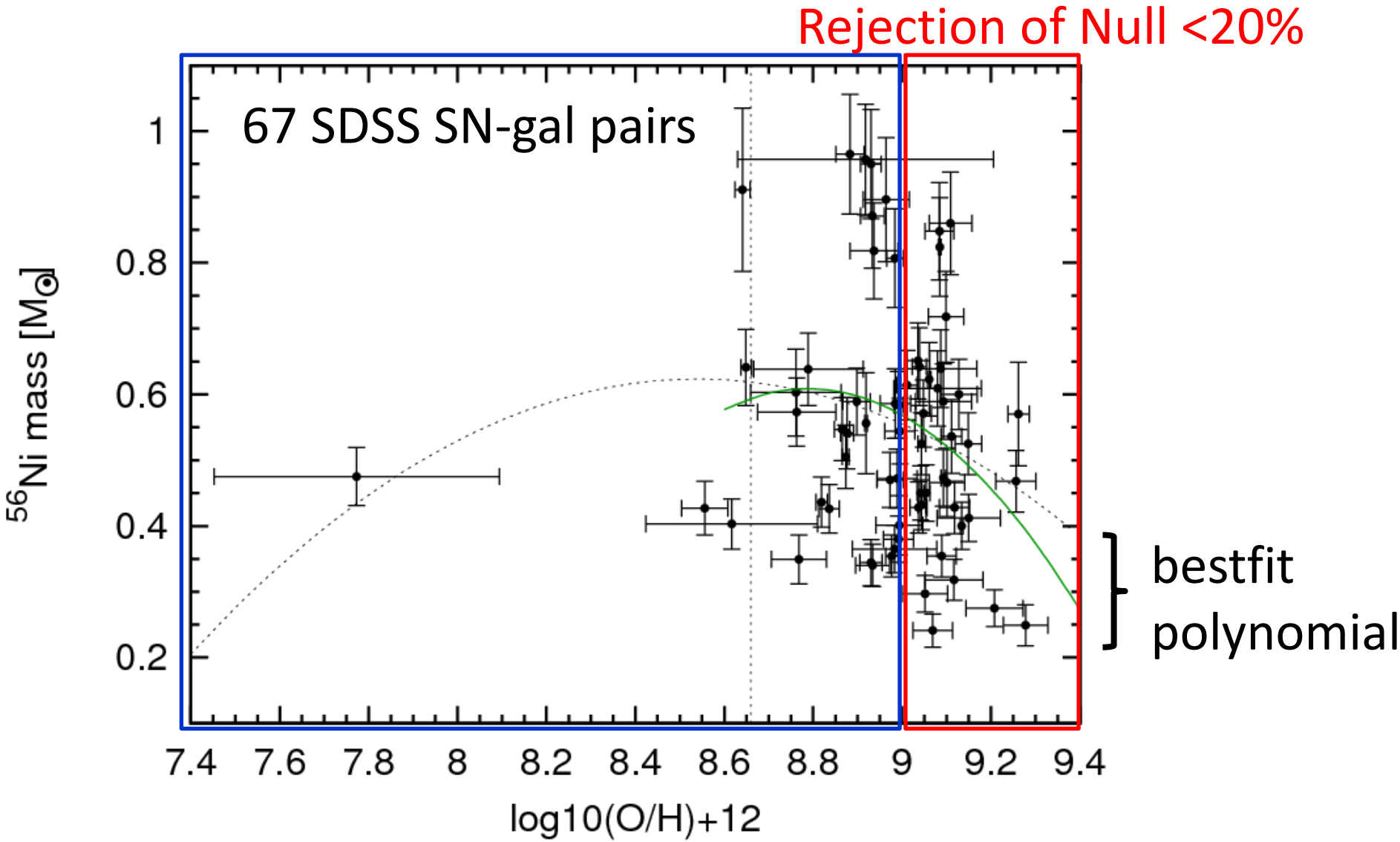
- Aim
  - dependence of 56Ni mass and LC param on hosts

- Sample
  - Spectroscopically confirmed SNe Ia

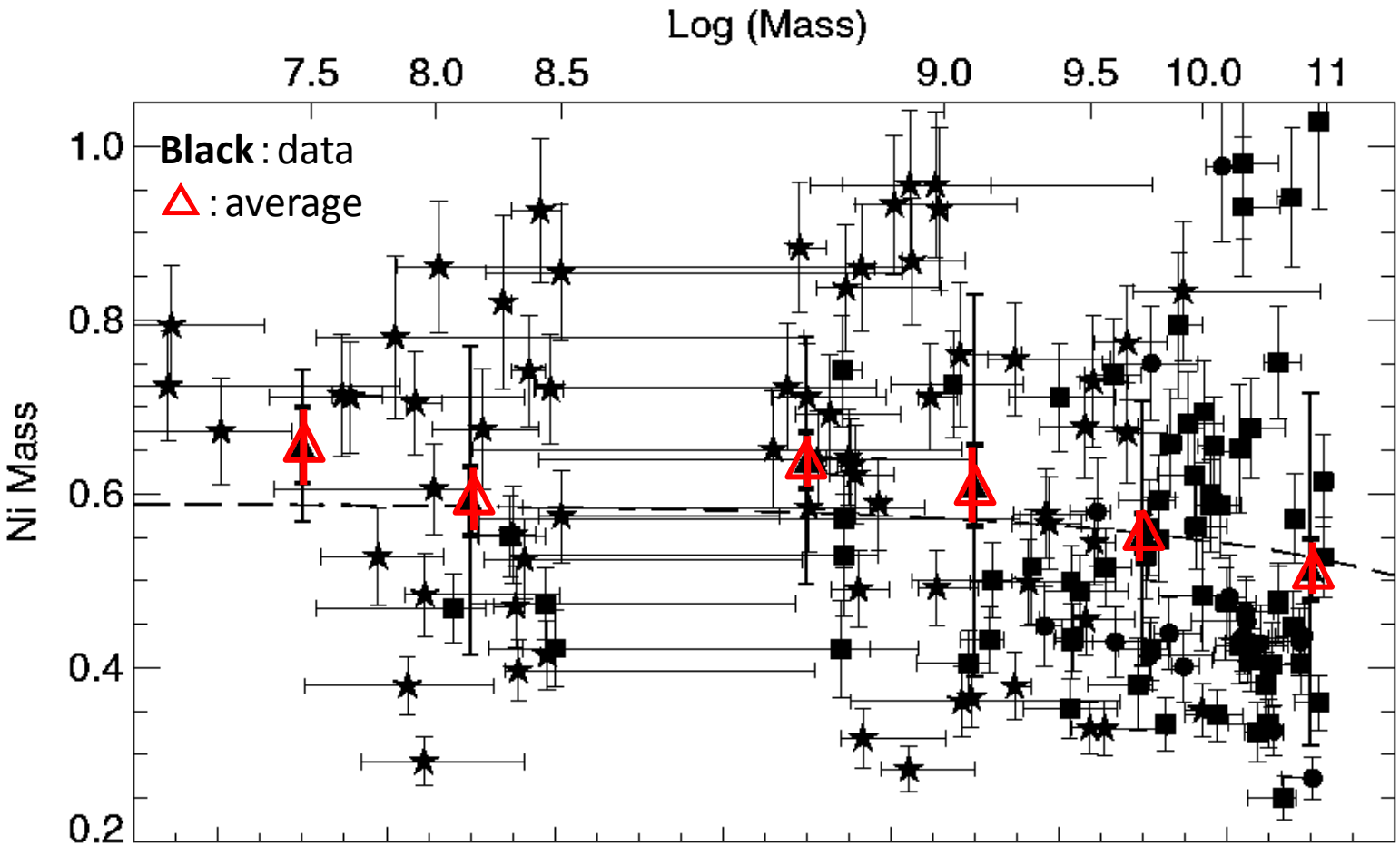
    → SALT2 fitting to obtain (x1, c, m_B)
    - Derive L_{bol} by integrating SALT2 spectrum with x1 and c
    - Convert L_{bol} to 56Ni mass

  - + SDSS Legacy spectra
    - flux measurement (MPA group) http://www.mpa-garching.mpg.de/SDSS/DR7
    - metallicity from strong lines of [NII], [OII], Hβ (Kewley & Dopita 2002)
    - SFR Surface density = L(Hα)/physical scale
    - EW Hα

Metallicity effect (1)



Howell+ 09: stellar mass and ^{56}Ni mass

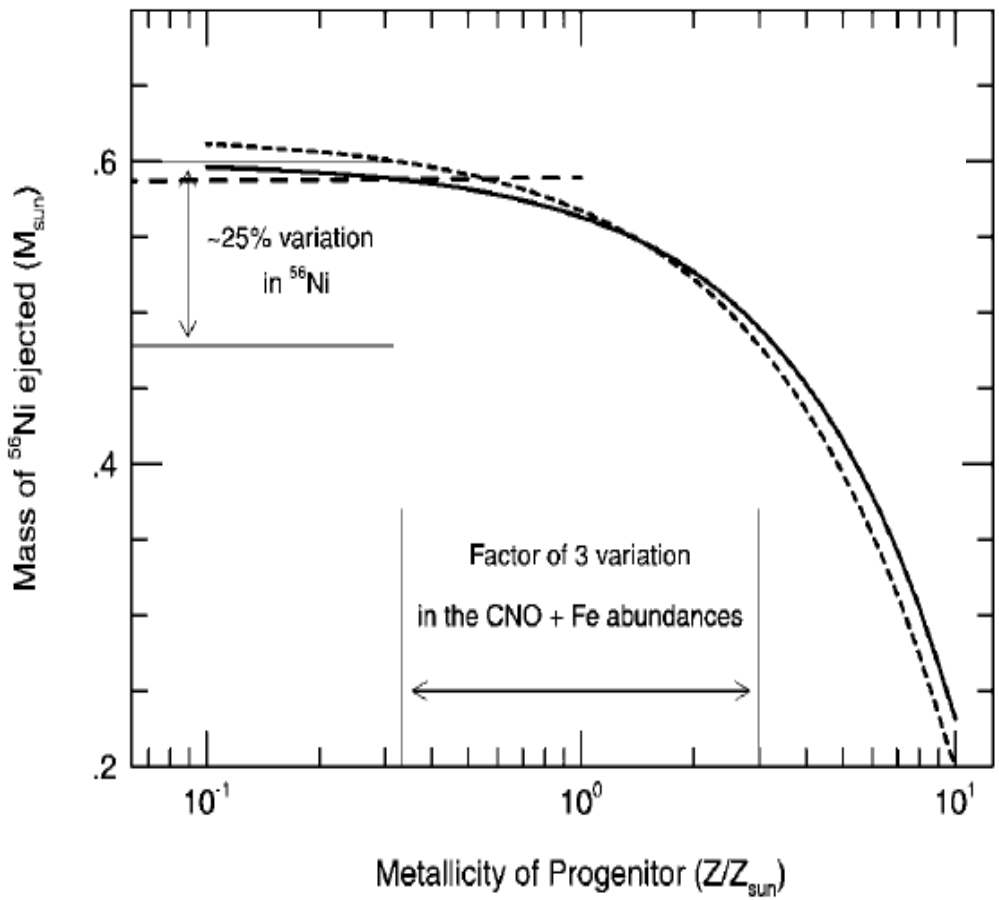


High-z (SNLS 09)
Nearby (Neill+ 09)

↑ Obtain metallicity INdirectly (M-Z relation)

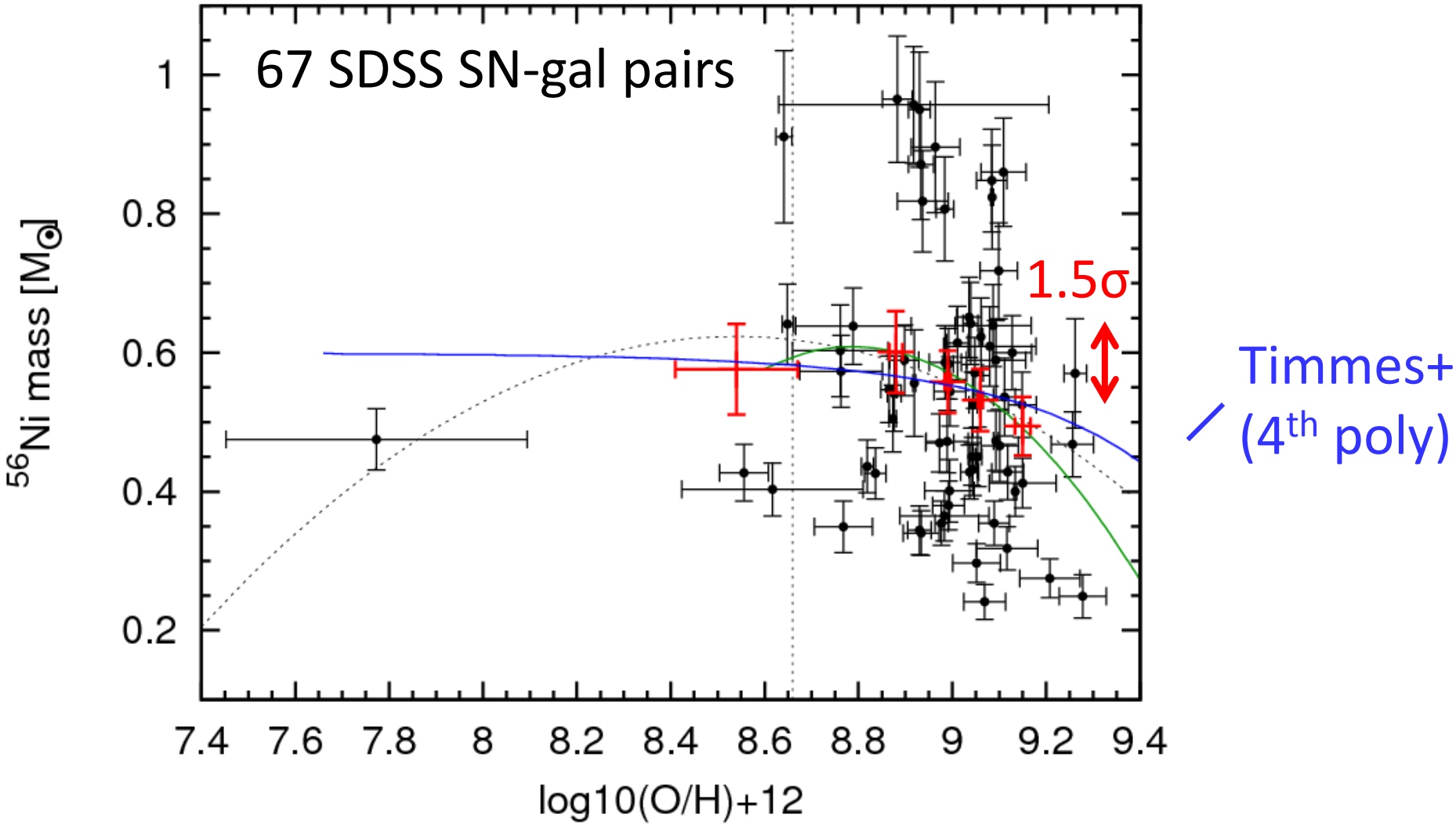
Metal-rich progenitor?

- Observed metallicity
- Average over 3”
- Representative of progenitor metallicity? (Howell+ 09, Neill+ 09)

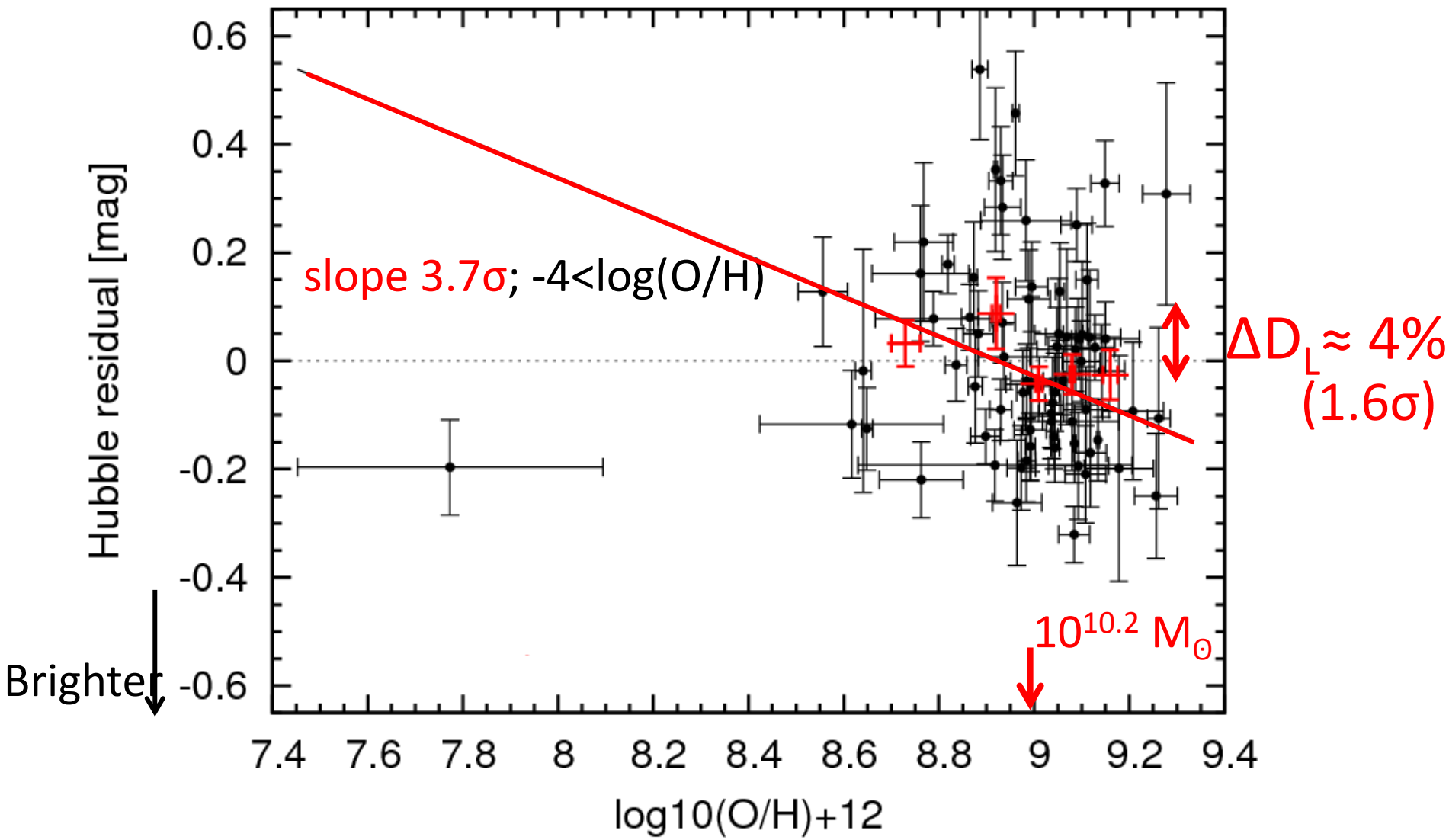


Timmes, Brown & Truran 03

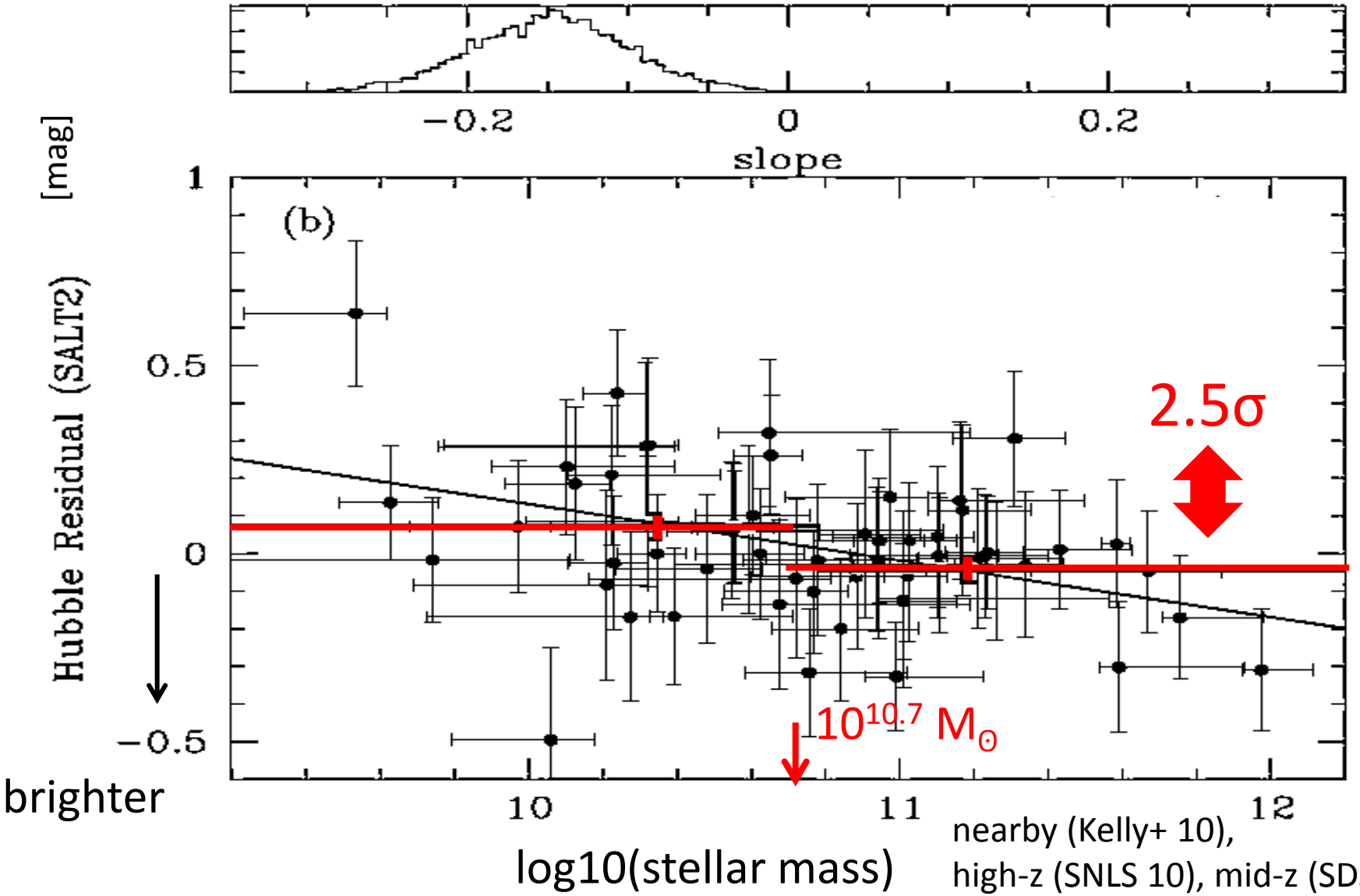
Comparison with their model



Metallicity effect (2)

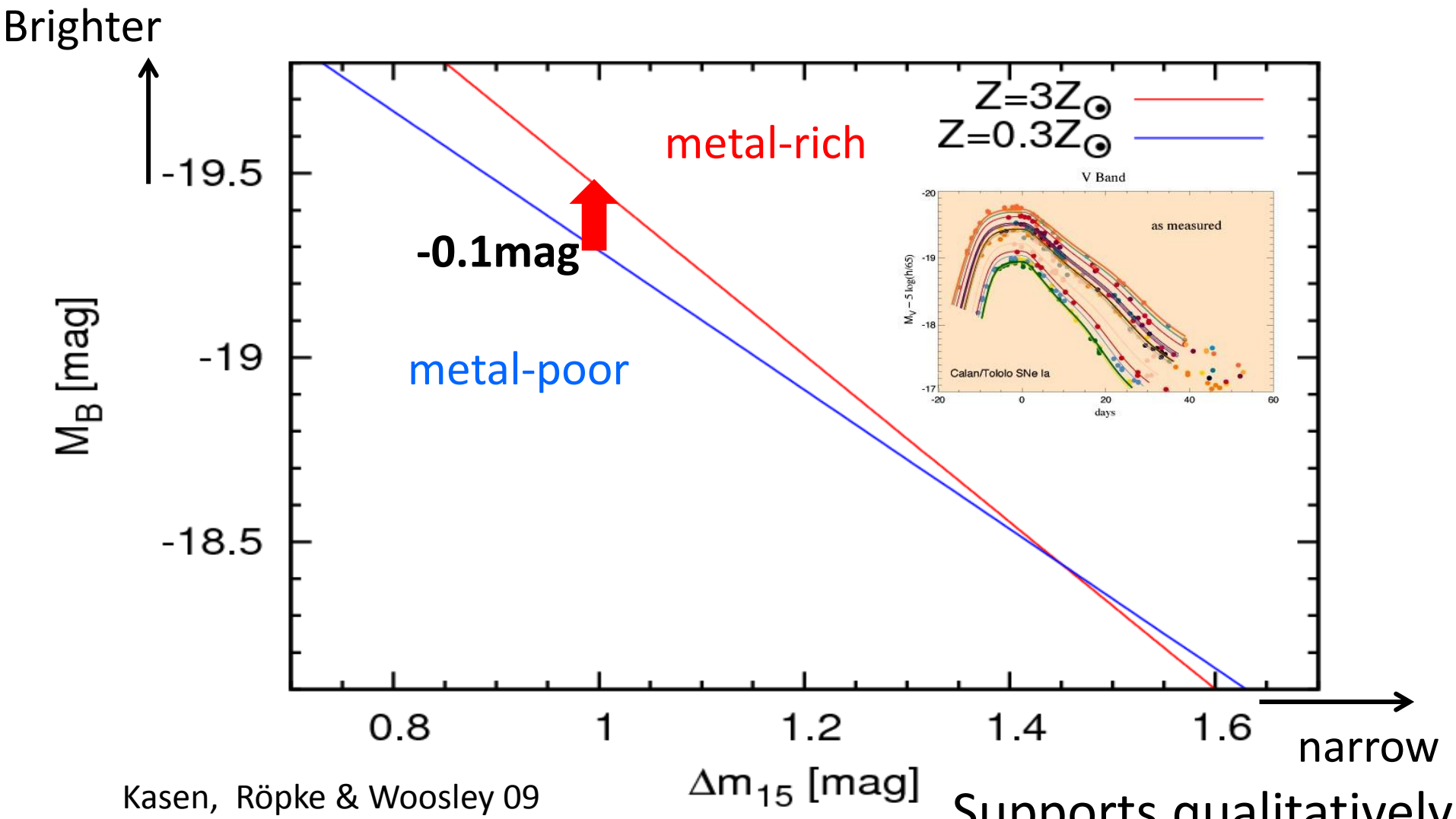


Kelly+10 : stellar mass vs HR



nearby (Kelly+ 10),
high-z (SNLS 10), mid-z (SDSS 10)

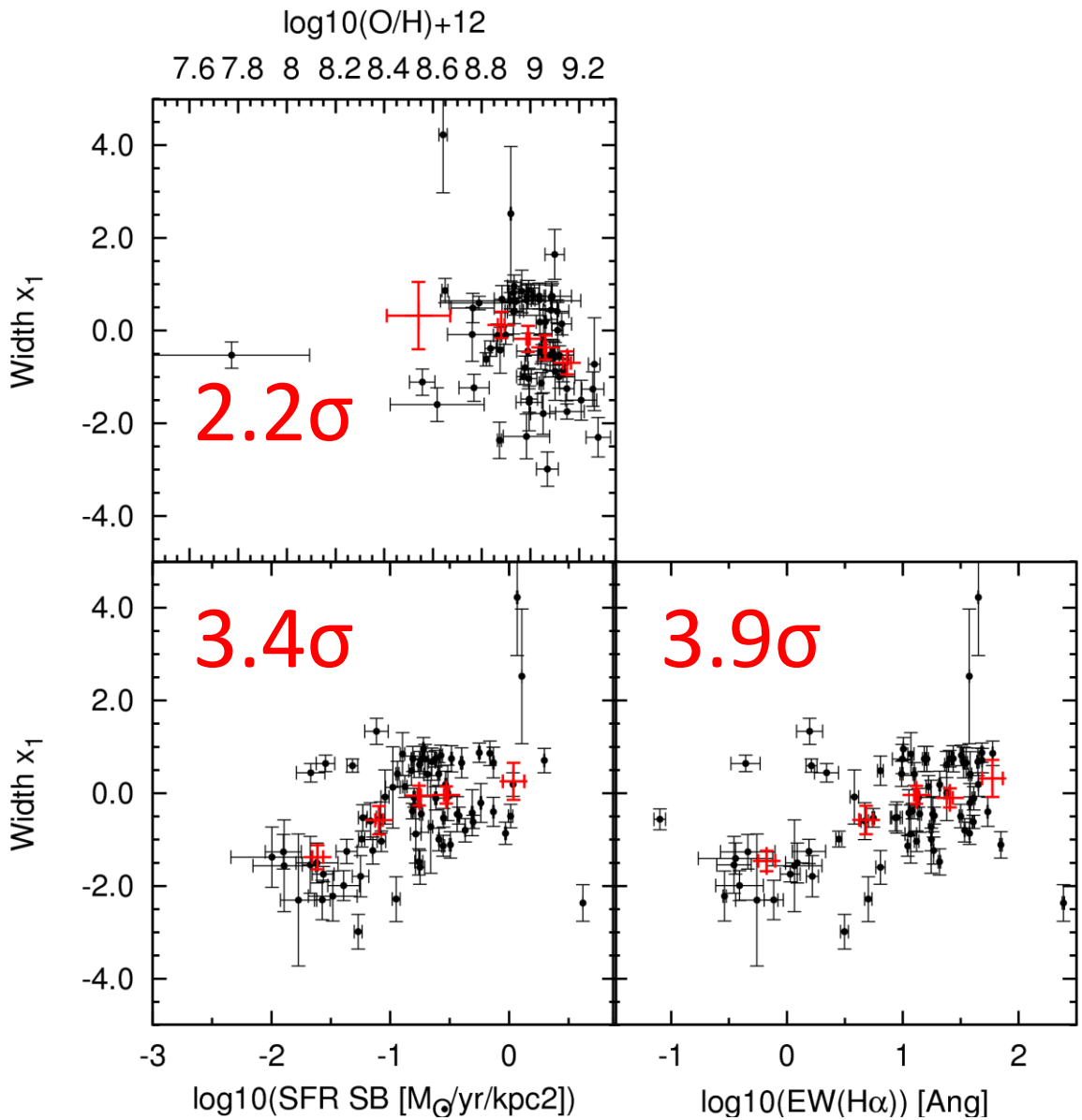
Progenitor metallicity?



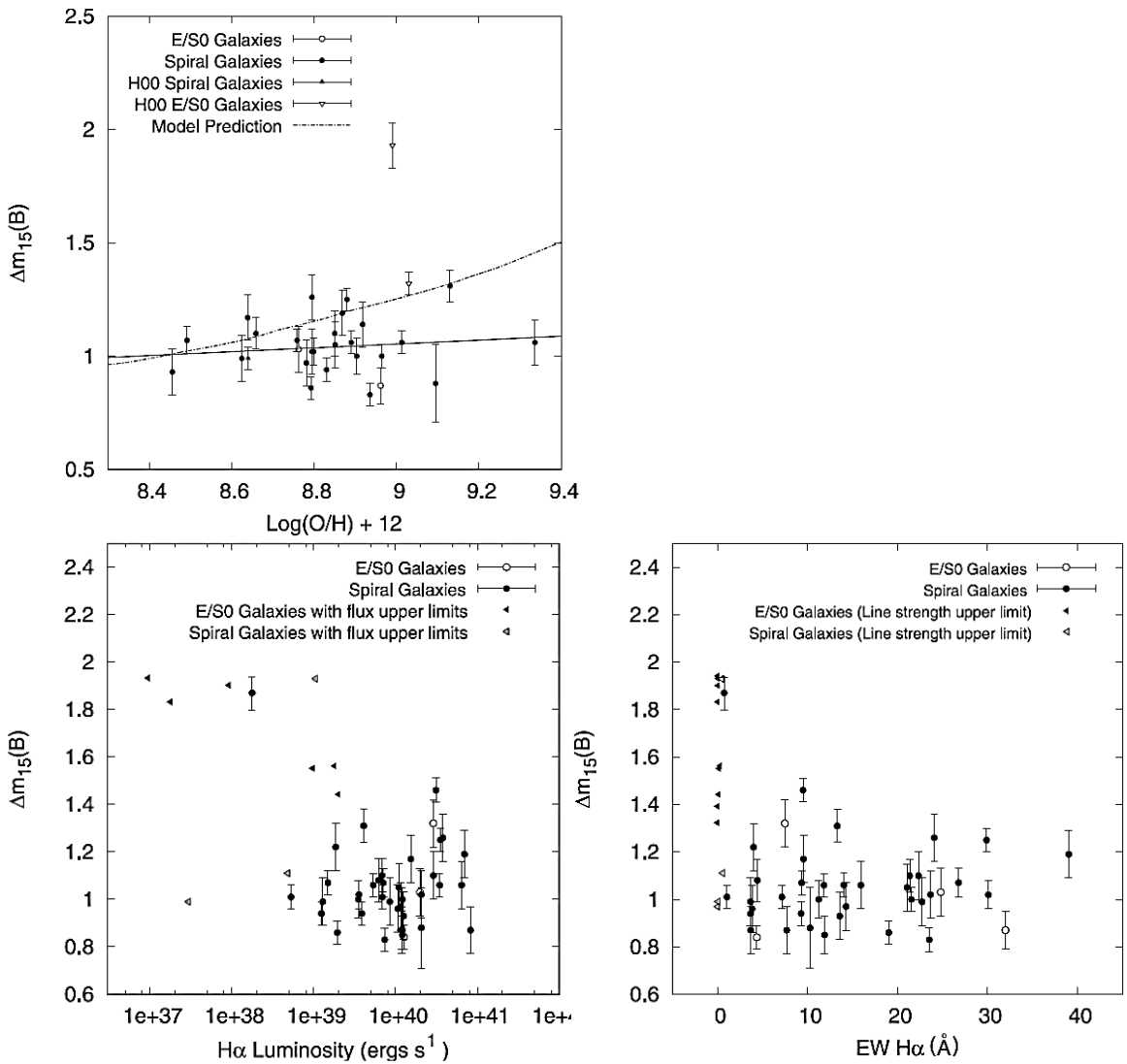
Kasen, Röpke & Woosley 09

Supports qualitatively

Trends with SALT2 LC width



Gallagher+ 05: trend with Δm15



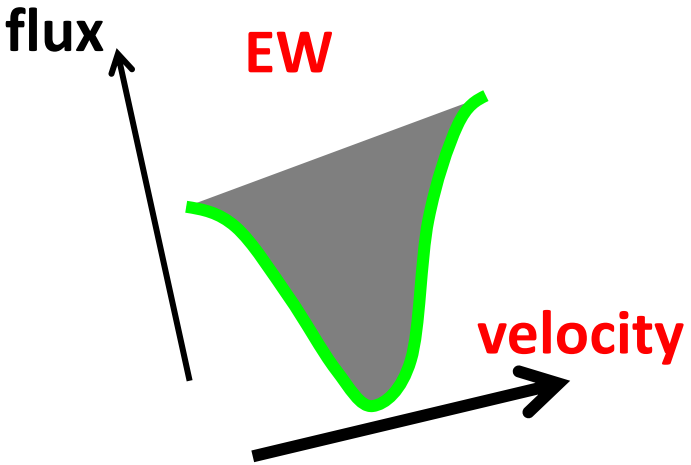
2nd: Subaru spectroscopy

- A data paper.
- Description
  - Observation with Subaru/FOCAS
  - Data reduction
  - Galaxy subtraction

3rd: Line profiles

Analysis

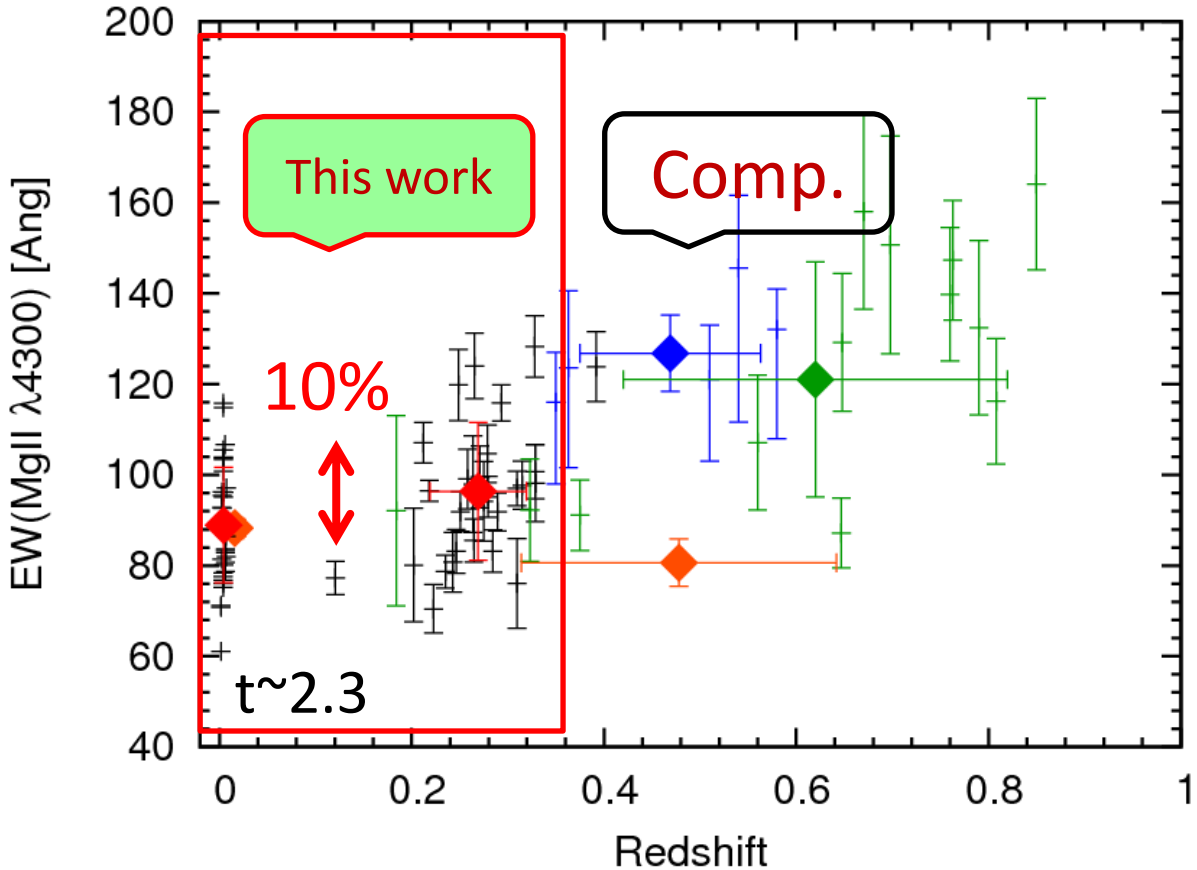
- ±5 days spectra
  - good S/N
  - easy comparison with high-z SNe Ia

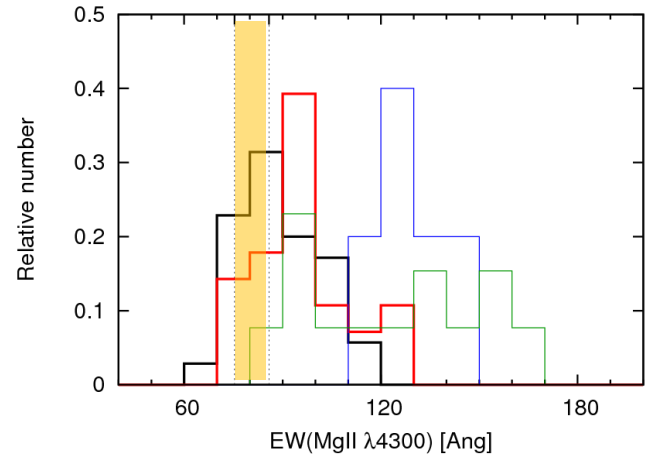


- Correction for temporal evolution
  - Spectral template of Hsiao+ 07
- T test for evolution
  - EW and velocity for nearby and SDSS/Subaru SNe Ia
  - Distributions for Subaru Ia are consistent for most of the lines.

EW :	CaII 3945	SiII 4130	MgII4300	FeII 4800	SII W	SiII 5972	SiII 6355
velocity :	UV2	CaII 3945	SiII 4130	SII 5454	SII 5640	SiII 5972	SiII 6355

MgII 4300?

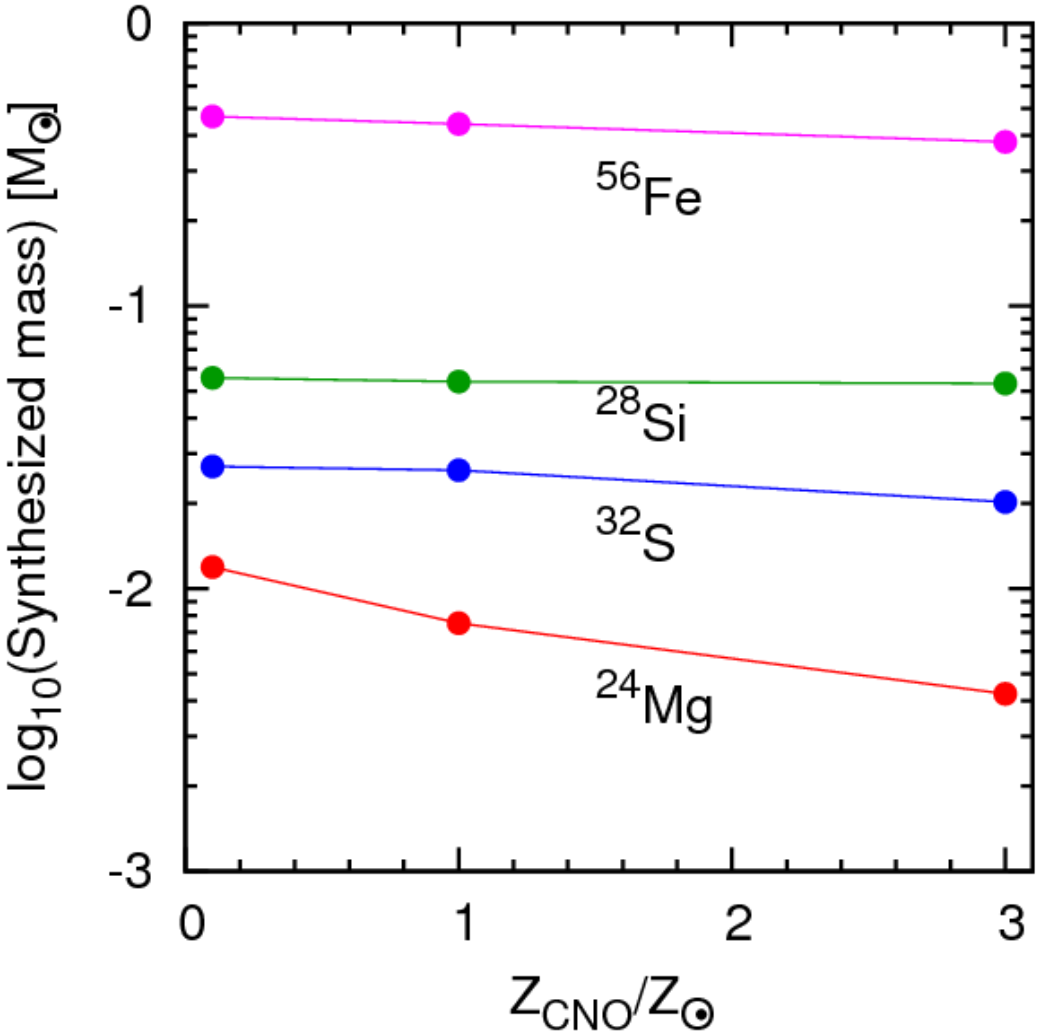




High-z SNe Ia
Garavini+ 07
Bronder+ 08
Sullivan+ 09

MgII line increase for mid-z SNe Ia? (>2σ; t=2.0 for nearby + Subaru)
Inconsistency among high-z SNe Ia?

Mg synthesis at high-z?



- $\Delta EW \approx \Delta Mass(Mg) \approx +10\%$

→ $\Delta Z_{CNO} \approx -0.2\ Z_\odot$

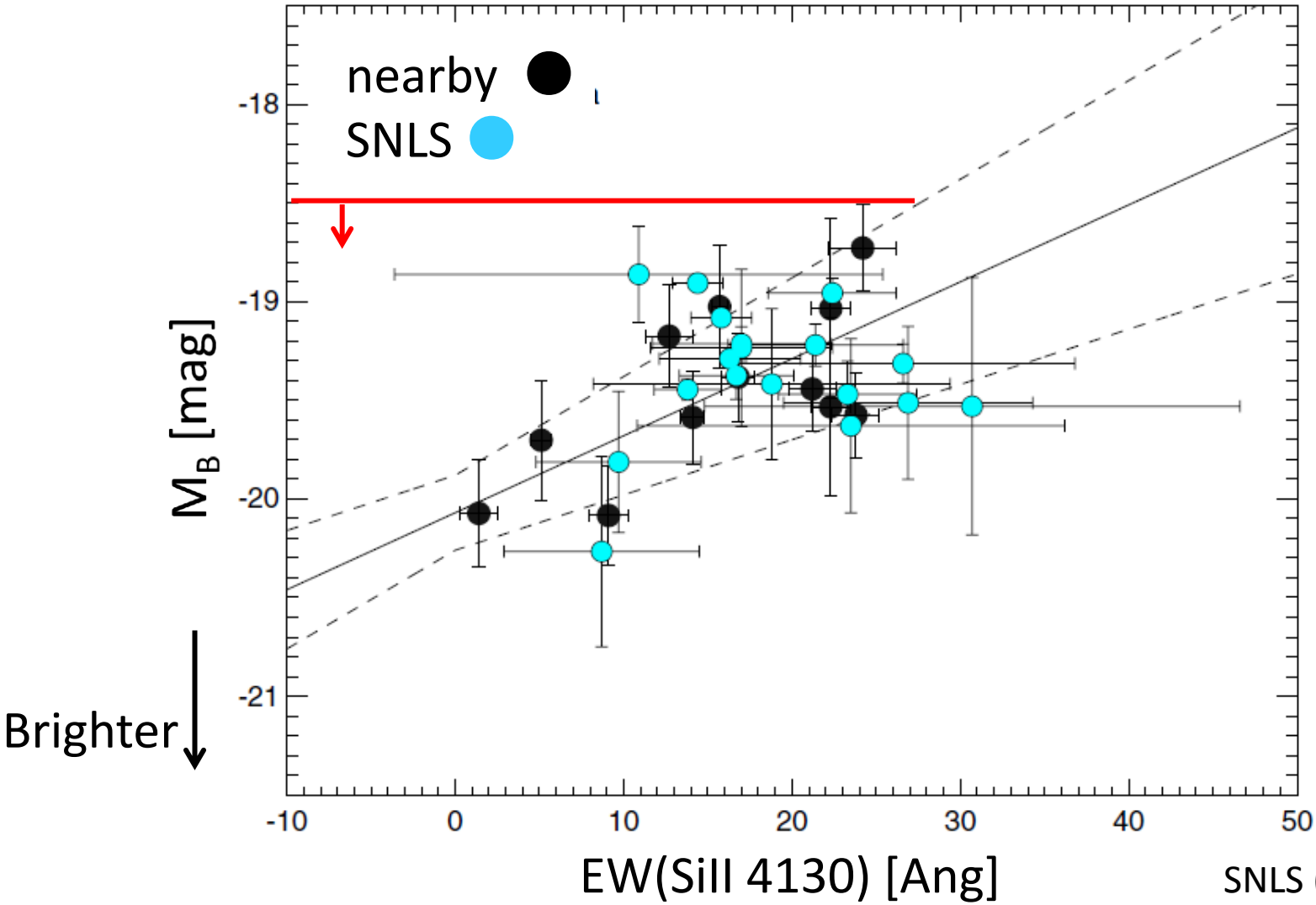
- Chemical evolution

$\Delta Z \approx -0.2\ Z_\odot$ (Rodrigues+ 08)

⇒ Mg synthesis increase toward high-z?

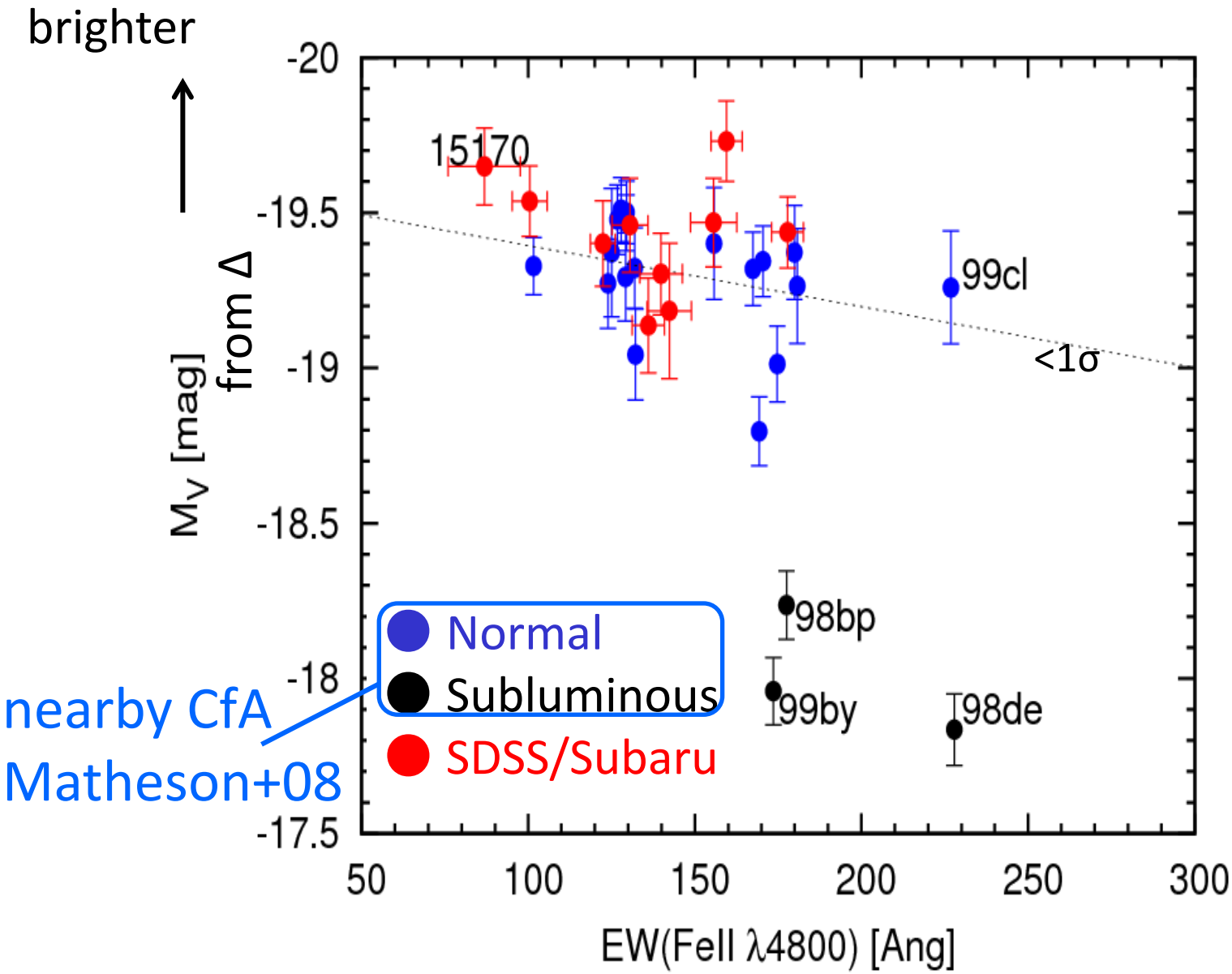
Travaglio+ 05

4th: Spectral luminosity indicator



SNLS (Bronder+ 08)

FeII 4800


brighter
-20
-19.5
-19
-18.5
-18
-17.5
M_V [mag]
from Δ
15170
99cl
<1σ
98bp
99by
98de
Normal
Subluminous
SDSS/Subaru
nearby CfA
Matheson+08
50
100
150
200
250
300
EW(FeII λ4800) [Ang]

Additional works

- Subaru Spectroscopy
  - Comparison between Chen/Masao's and mine: Typing & Redshift
  - Examine SN6471: SNII-P possibly in Passive gal at highest z (z=0.202)?
  - Examine the degradation of my 2D galaxy subtraction method in various cases (simulation)
- Line profiles
  - Comparisons with NTT/NOT spectra (Jakob's paper)
  - Statistical analysis on evolution
  - Implement other one-line comments from Ariel and Linda
- EW Correlation
  - with V-band brightness as inferred from the SN brightness:
    1) $M_V = M + P\,\Delta + Q\,\Delta^2 + \mu - \mu(z) - Av$
    2) $M_V = V - \mu(z) - Av$
  - with Hubble residual: $HR = \mu - \mu(z)$