

The World of Clusters

GREAT ESF Workshop



Chemical tagging with old Open Clusters

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Padova, 24th September, 2013

Chemical tagging with Open Clusters

Open Clusters

- Stars formed from the **same giant molecular cloud**

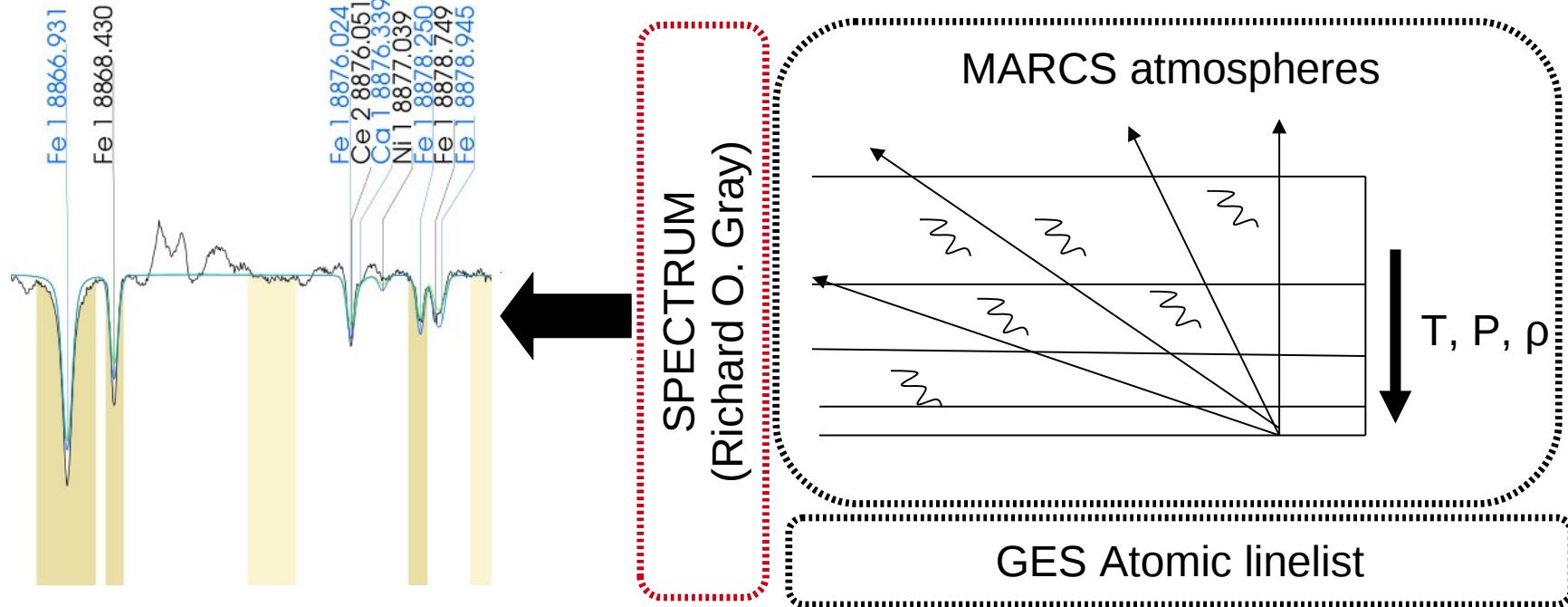


Chemical tagging with Open Clusters

Method

Chemical tagging with Open Clusters

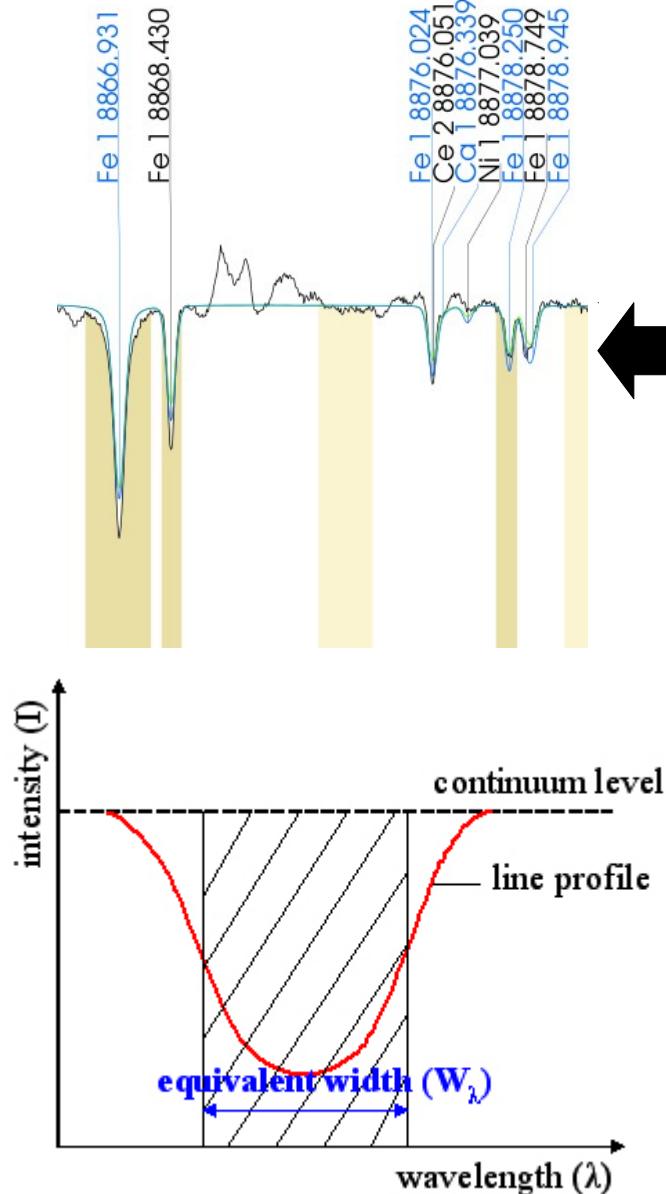
Benchmark stars



1 Atmospheric parameters

Chemical tagging with Open Clusters

Benchmark stars



SPECTRUM
(Richard O. Gray)

MARCS atmospheres

T, P, ρ

GES Atomic linelist

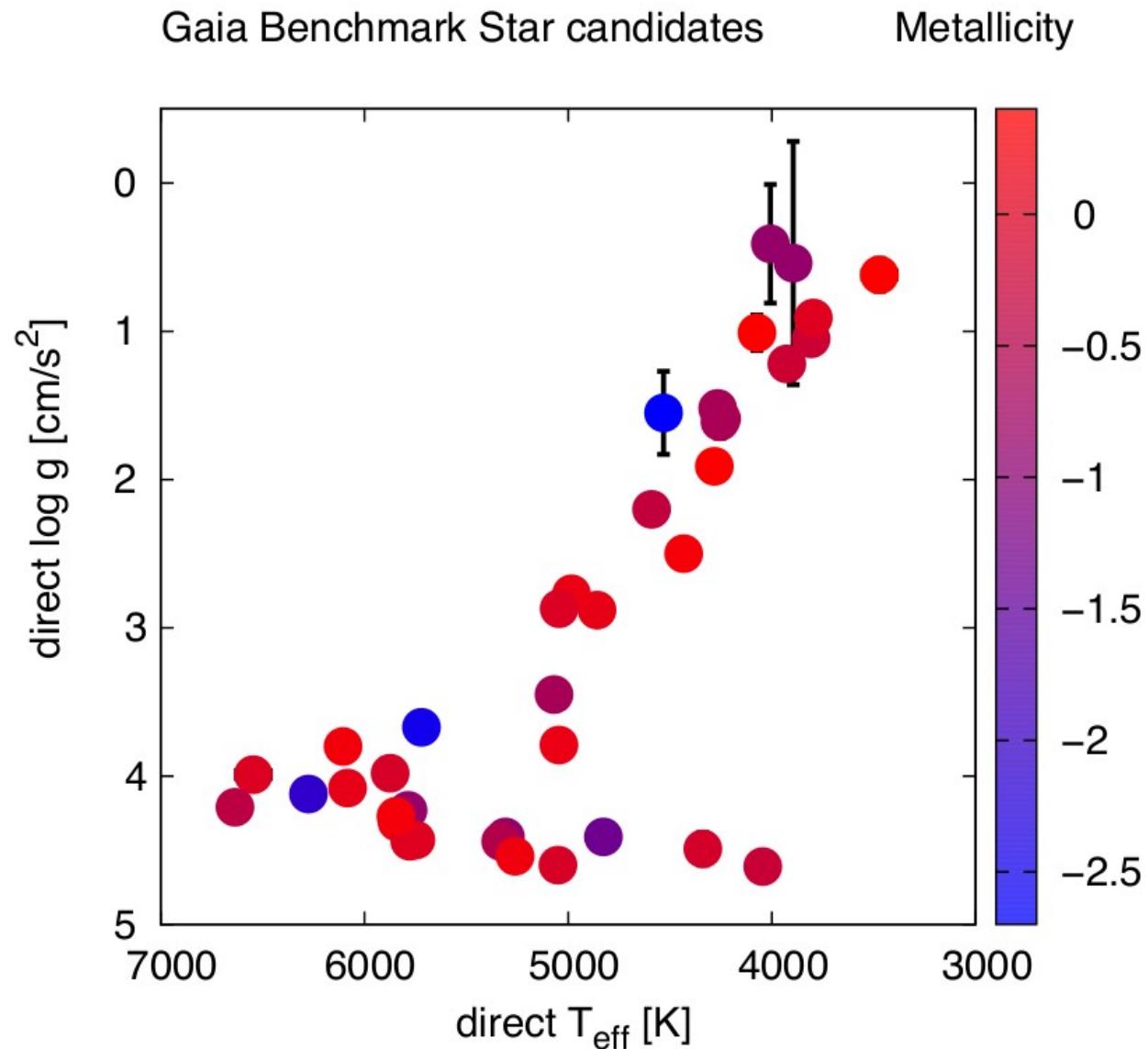
1 Atmospheric parameters

2 Chemical abundances

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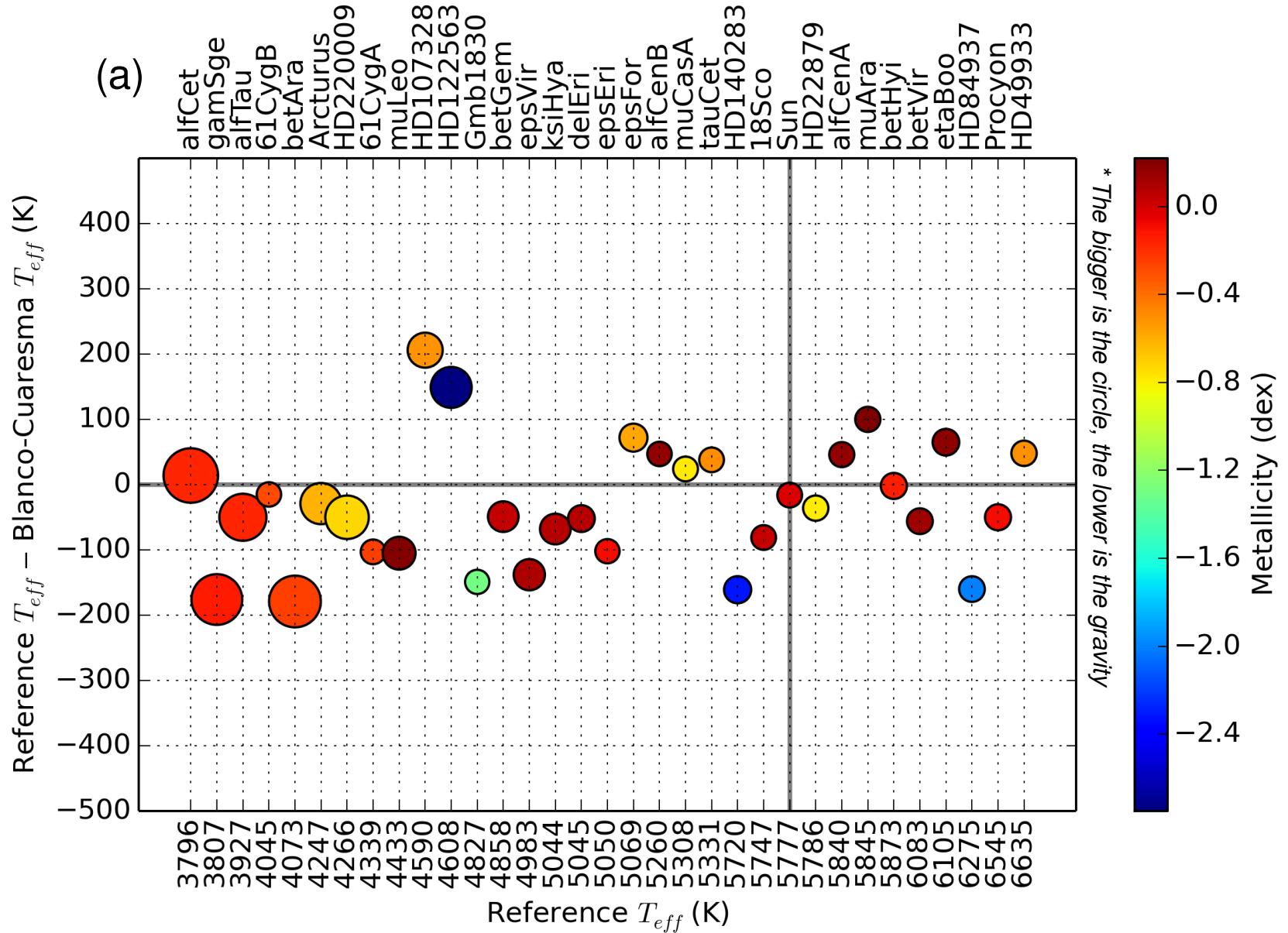
- Set of “well-known” stars covering a large parameter range



Astrophysical parameters and metallicities (Heiter et al. / Jofré et al. 2013, in prep.)
The benchmark stars' spectral library (Blanco-Cuaresma et al. 2013, in prep.)

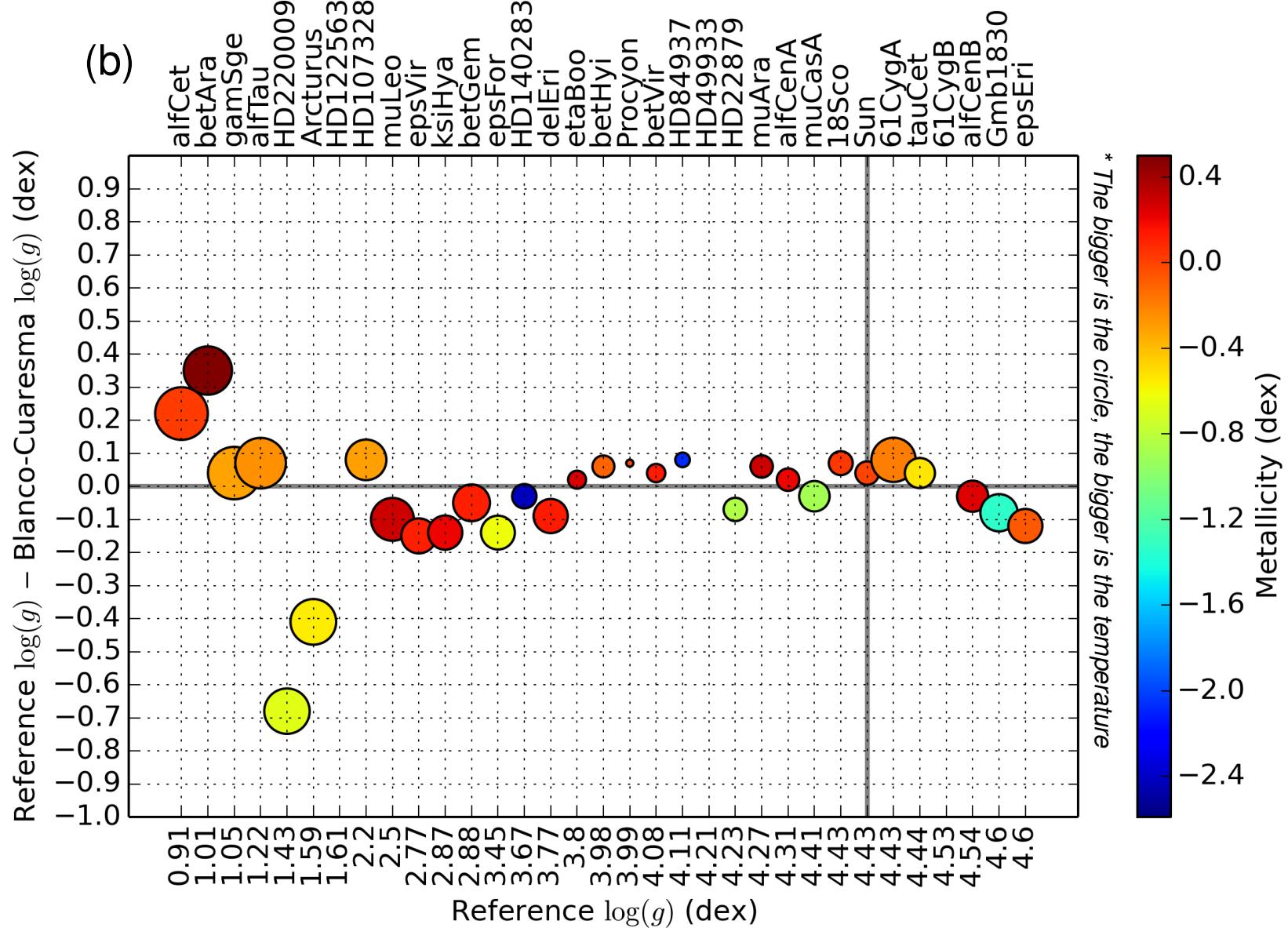
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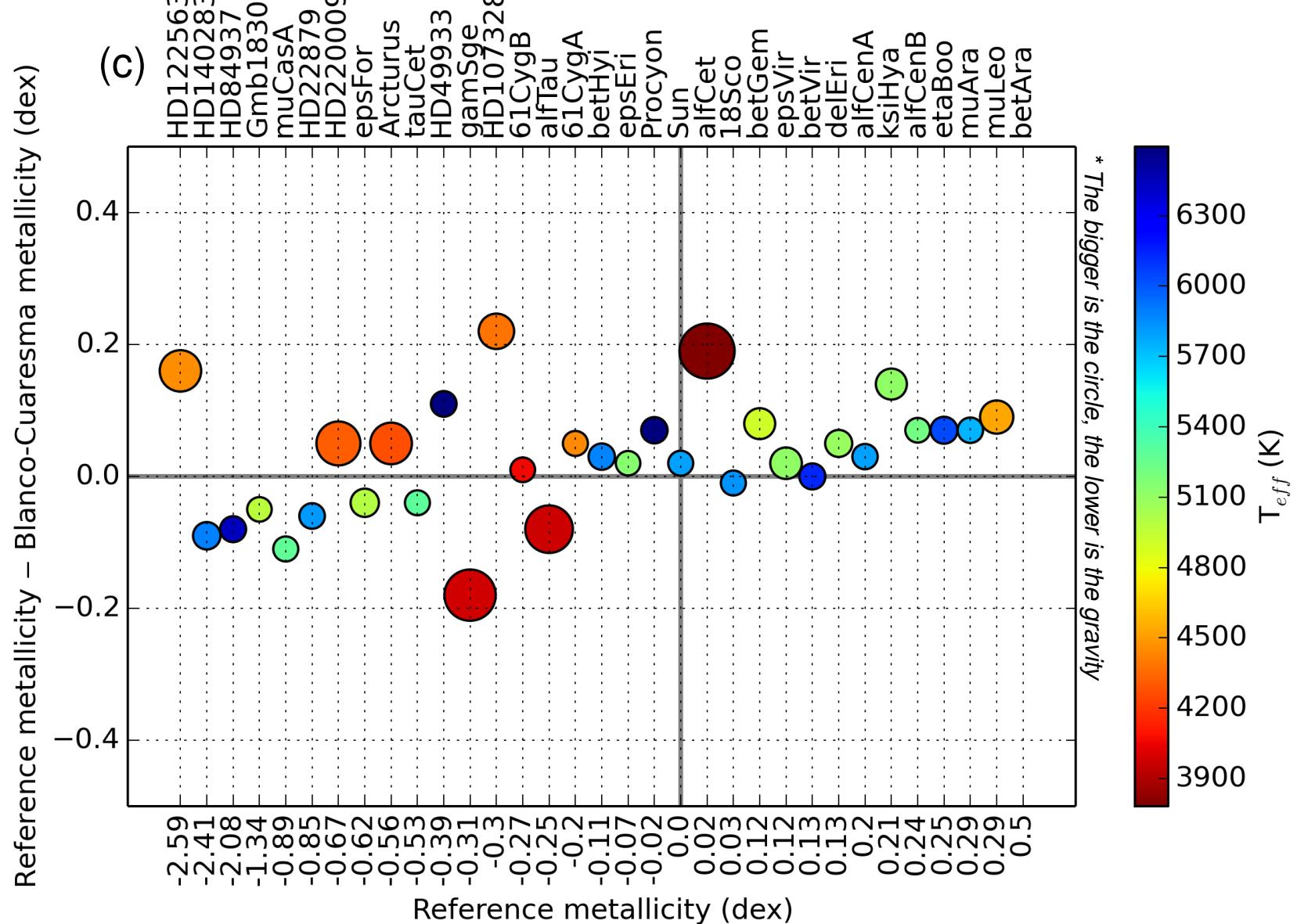
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Benchmark stars



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Benchmark stars



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Open Clusters

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Open Clusters - Observations

- High resolution spectra: $R \sim 80,000 \parallel SNR \geq 30$
 - NARVAL @ TBL (Pic du Midi, France)

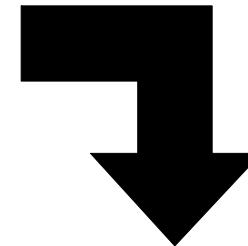
Cluster	# spectra
NGC 0752	7
NGC 6940	5
NGC 1817	4



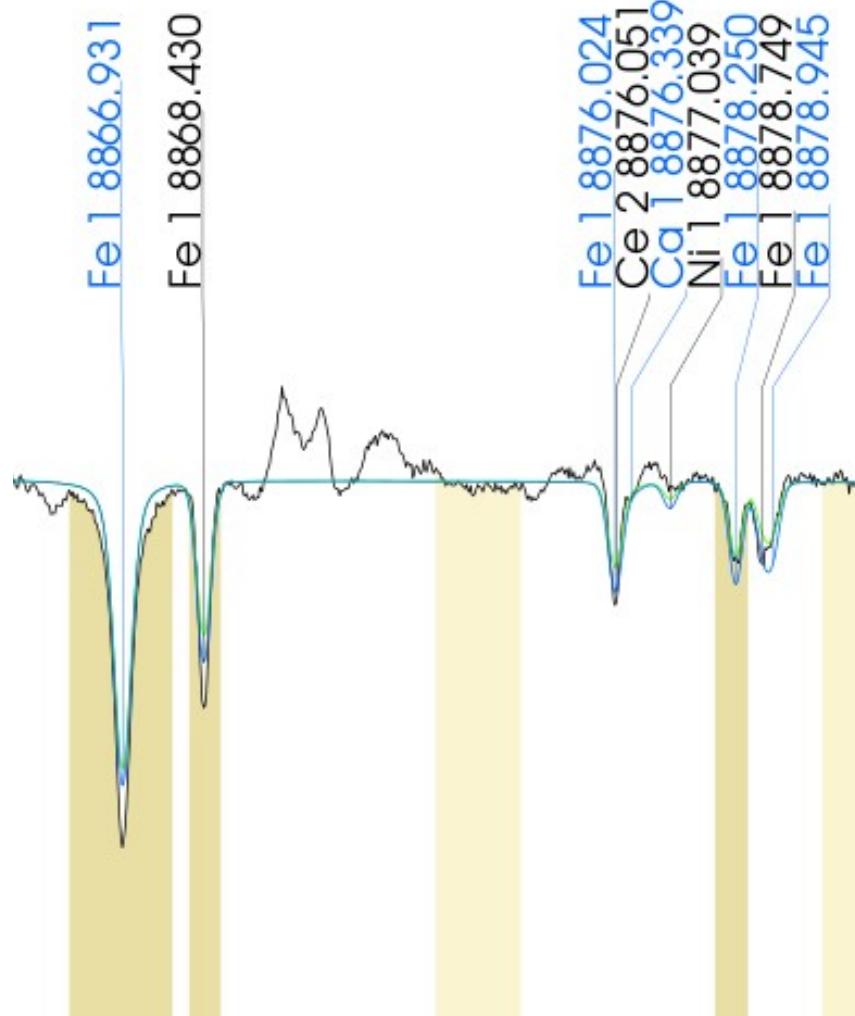
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Spectral analysis

- Spectral synthesis fitting method

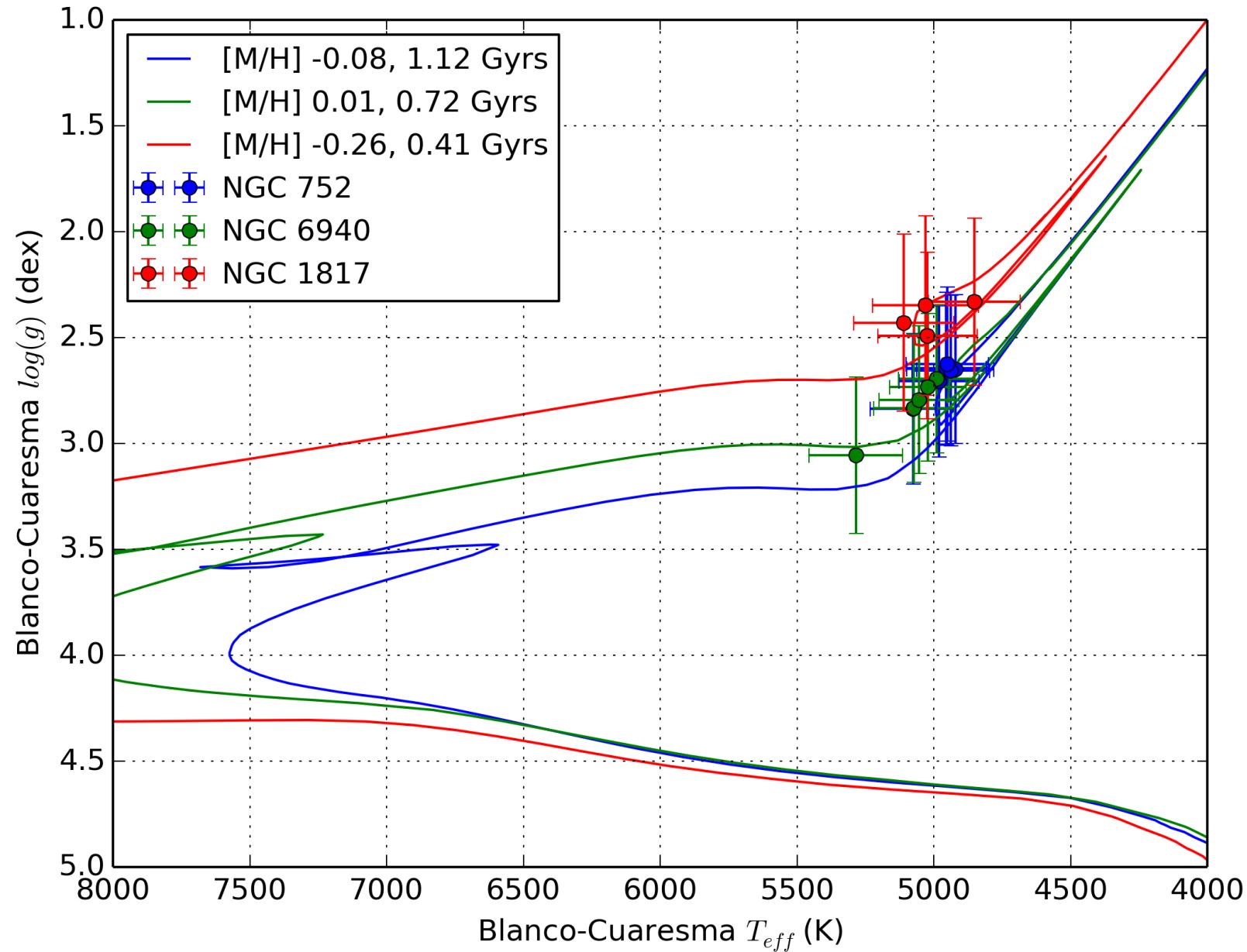


- Temperature
- Gravity
- Metallicity



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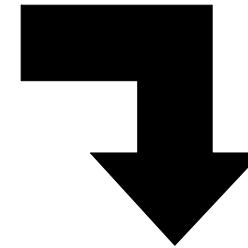
Open Clusters



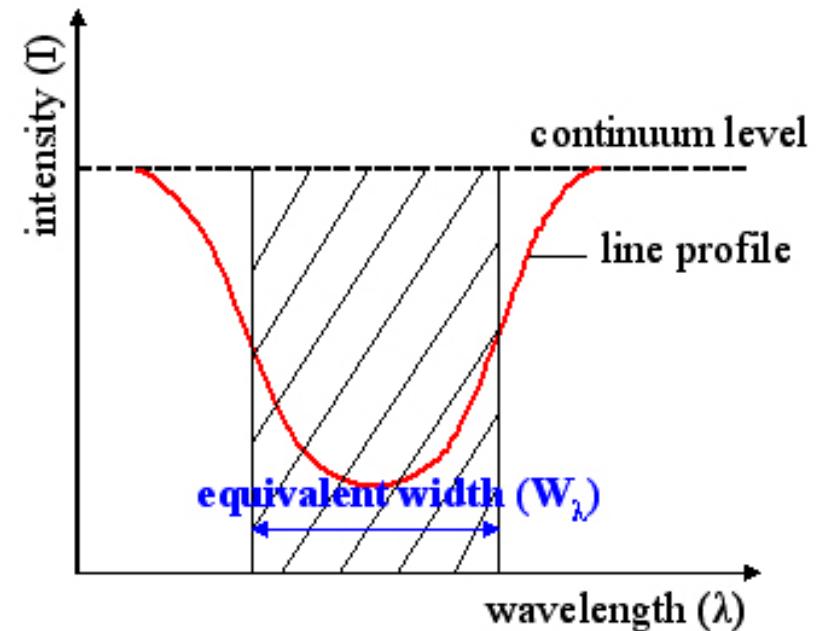
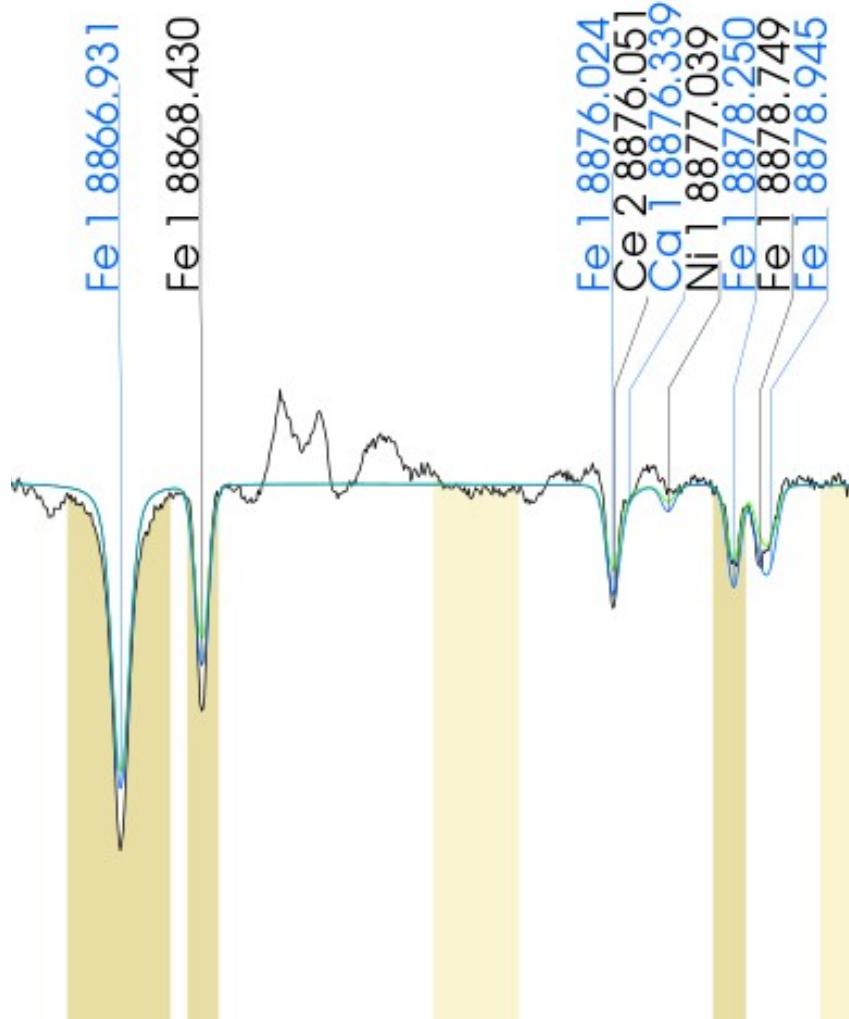
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Spectral analysis

- Spectral synthesis fitting method
- Equivalent Widths (EW) analysis

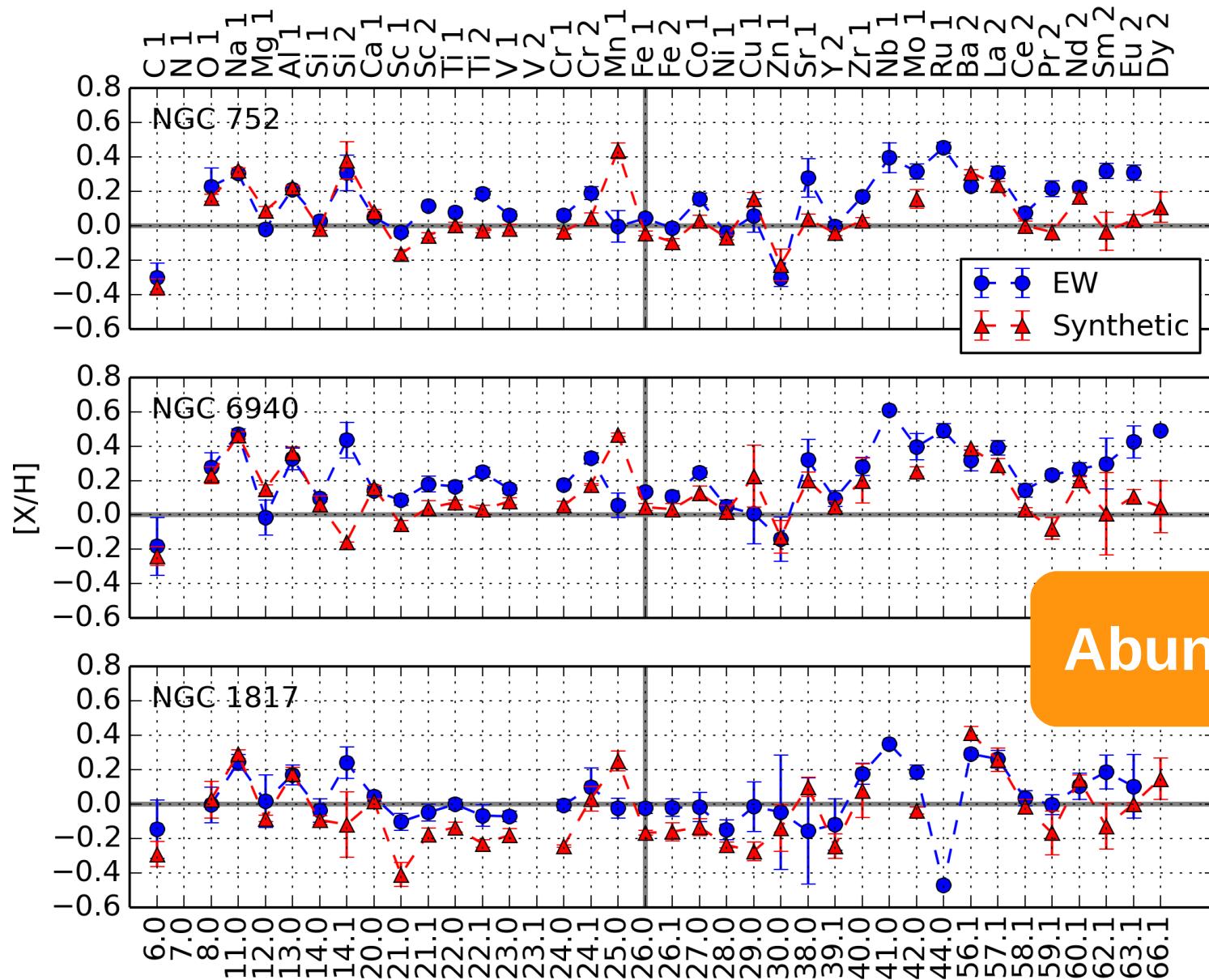


- Individual abundances



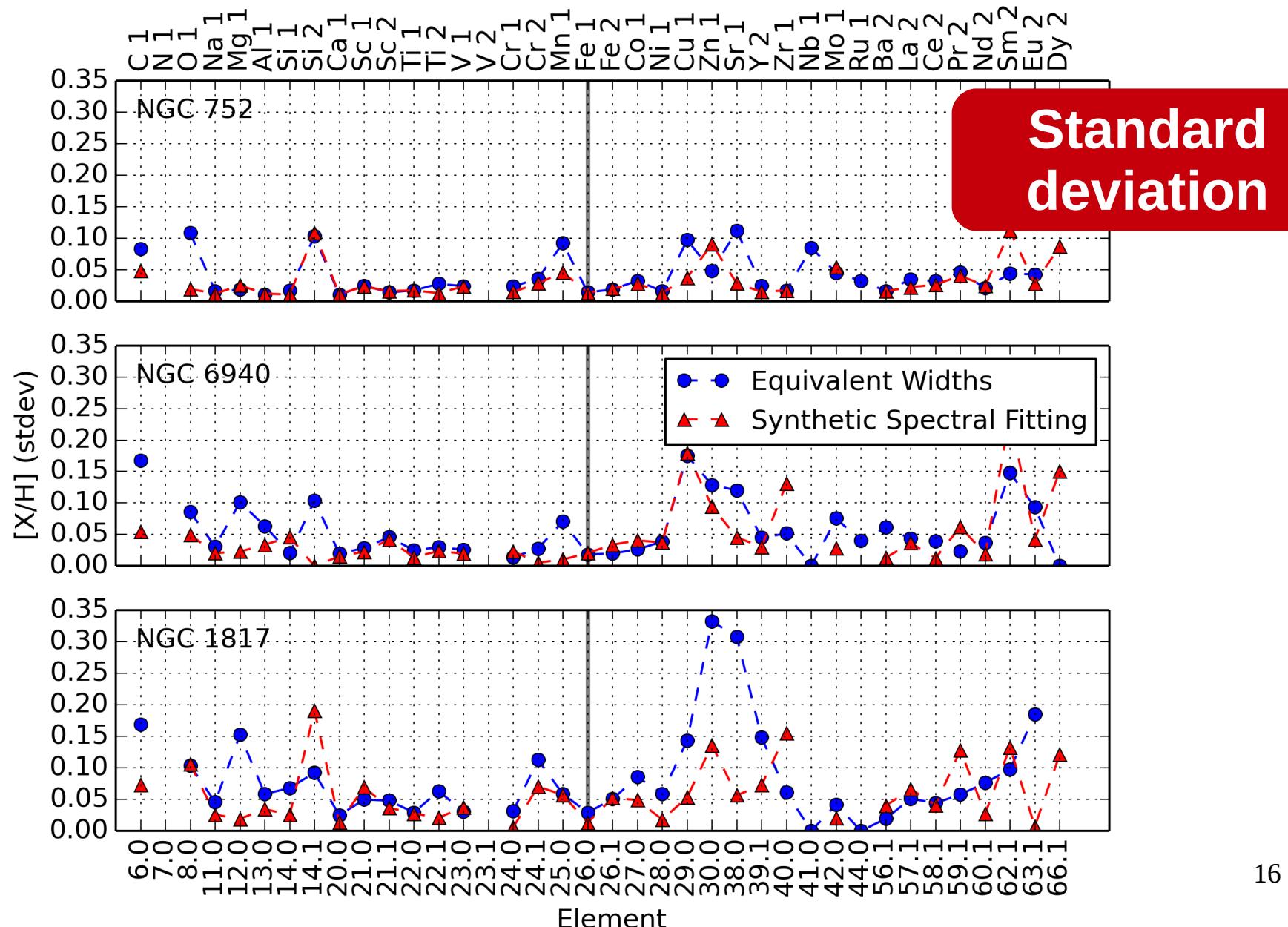
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Open Clusters



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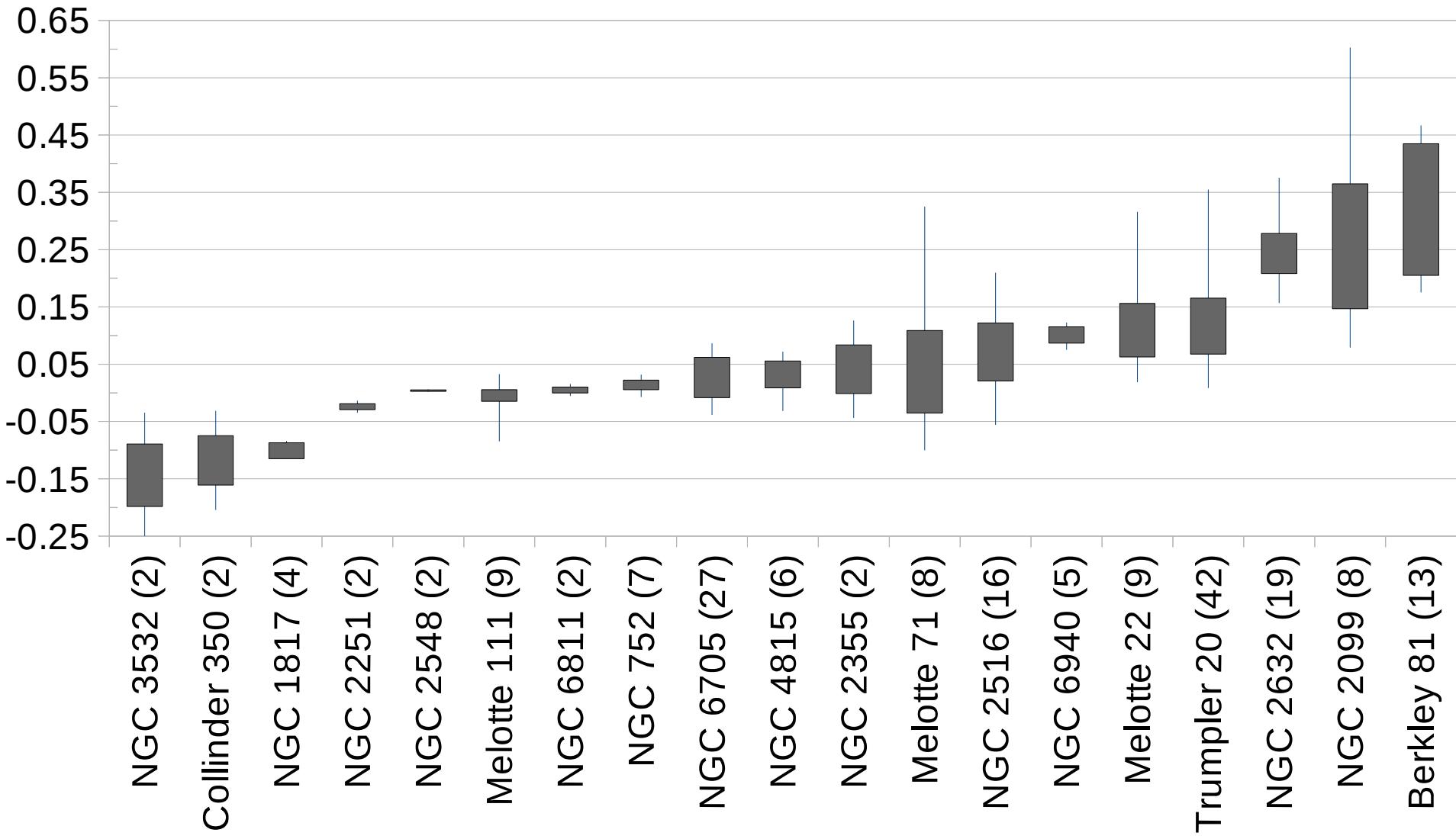


Chemical tagging with Open Clusters

Next steps

Chemical tagging with Open Clusters

Next steps



Chemical tagging with Open Clusters

Next steps



iSpec

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