Quantitative Spectroscopy with UVES

Invited talk at ESO Cal07

by

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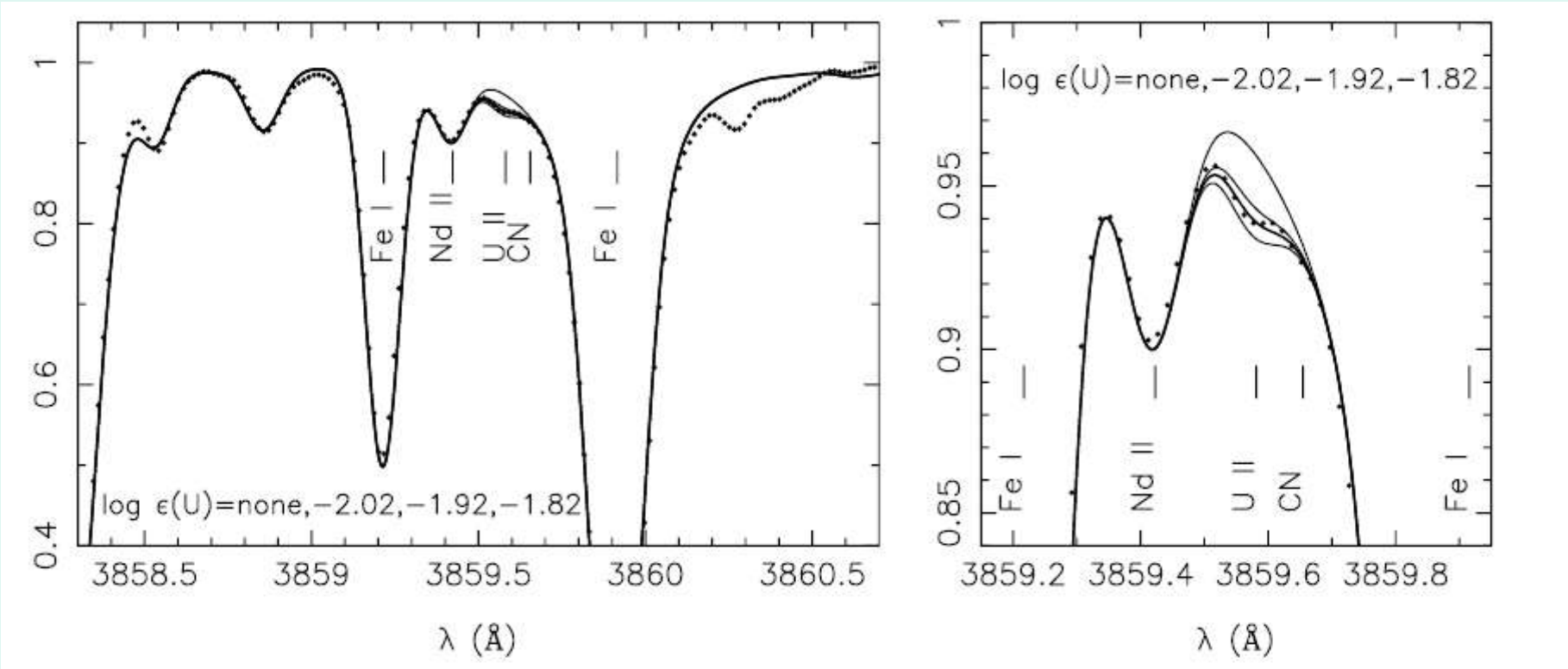
Number of refereed publications in 2005-2006 based on UVES data, according to the ESO Telescope Bibliography

- Stellar abundances: 58
- Stellar atmospheres: 45
- Stellar interiors (asteroseismology): 9
- Stellar kinematics (incl. binaries): 15
- Solar system: 4
- Exoplanets: 15
- Interstellar matter: 17
- Quasars and DLAs: 39
- Other: 8
- ---
- Total number: 210
- ---

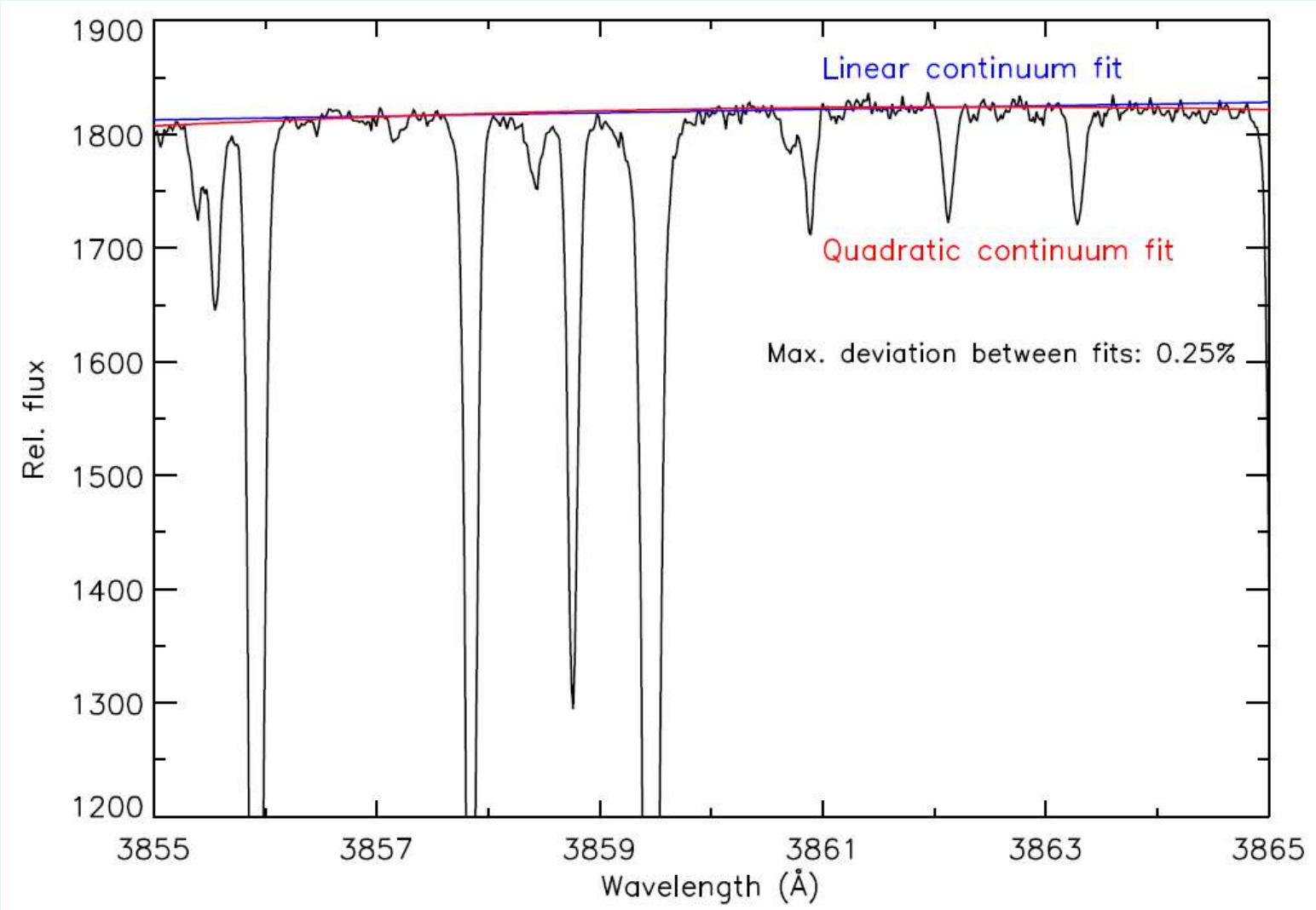
Average number of citations per Jan.1, 2007 according to ADS is 7.0.

(Average number of citations for all astronomical papers in 2005-2006 is 3.0)

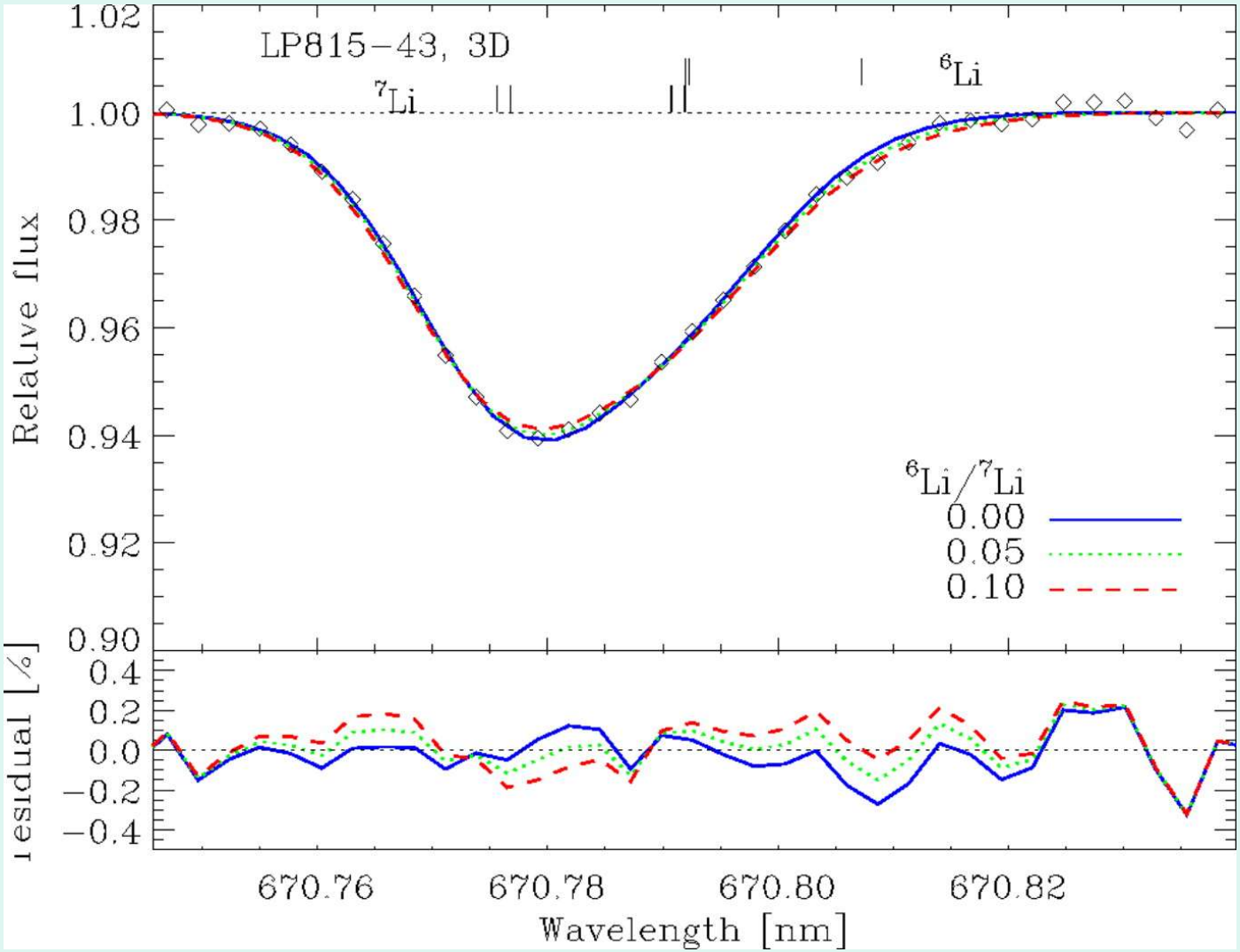
Detection of the UII 3859.5 Å line in the metal-poor K-giant star CS31082-001 by Hill et al. (A&A, 387, 560, 2002)



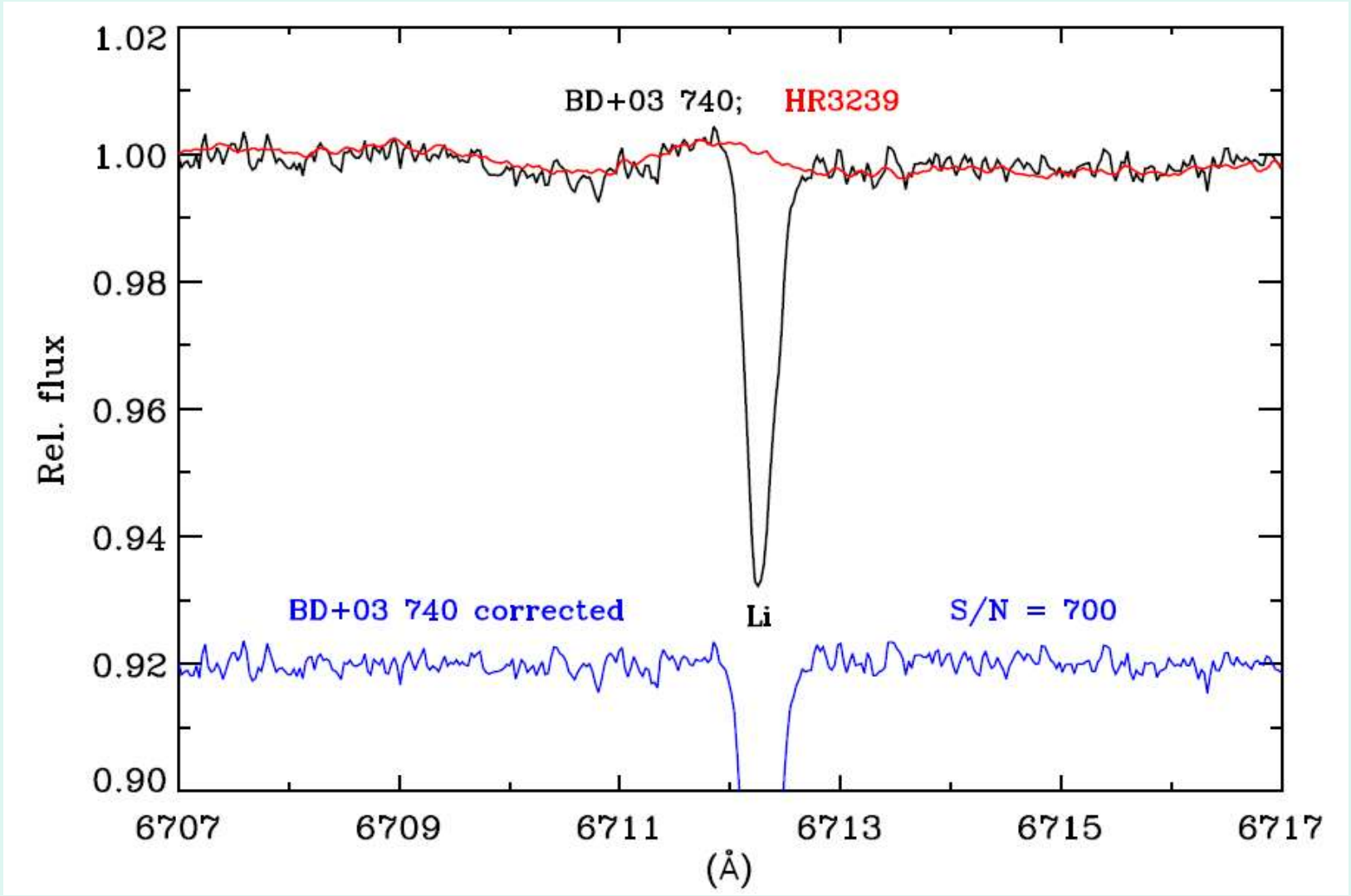
UVES POP spectrum of HD84937 (Teff=6360K, logg=4.1, [Fe/H]=-2.1) in the region of the UII 3859 Å line.



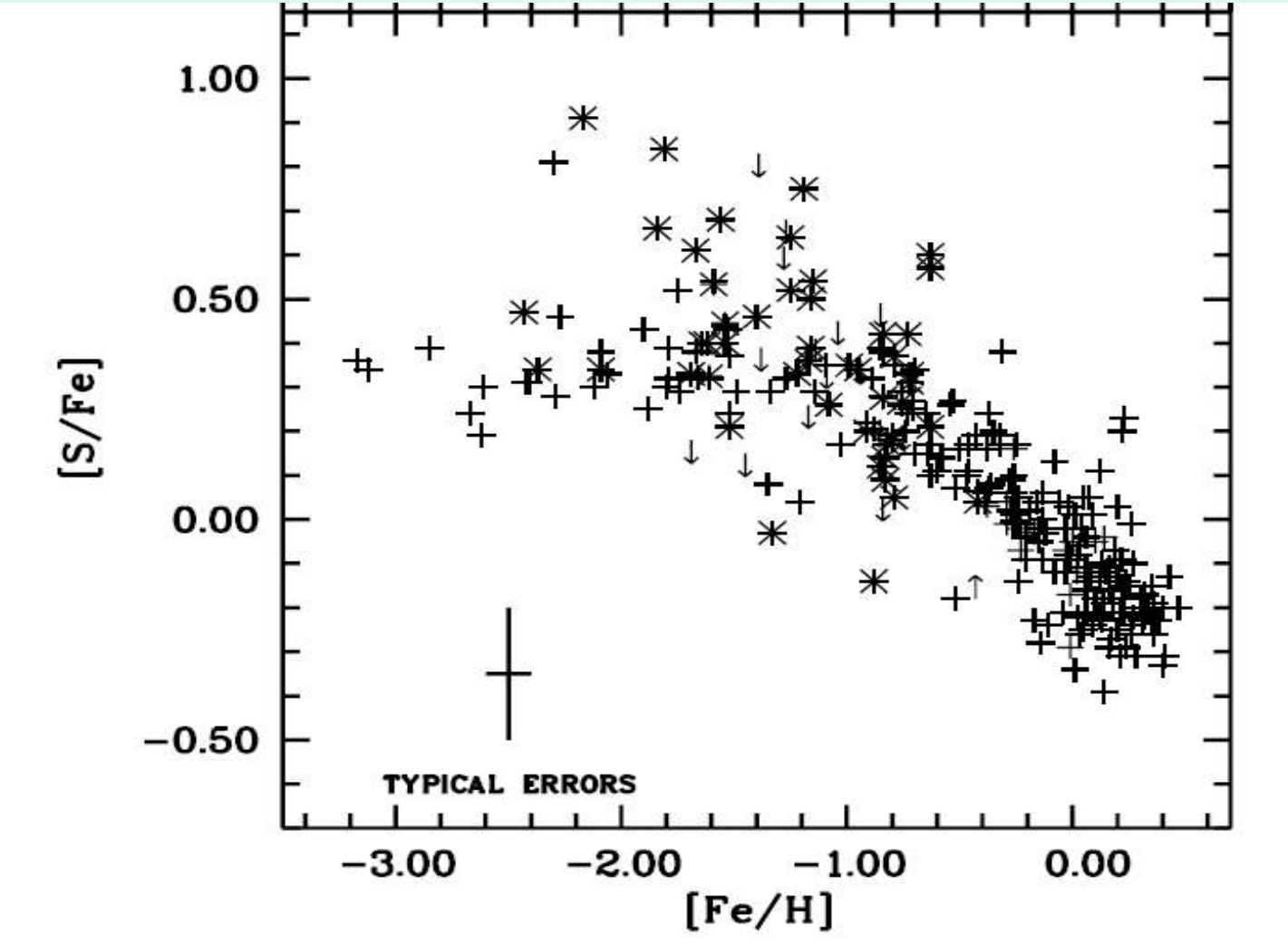
3D model atmosphere fit to UVES spectrum (R=100000, S/N=600) of the Li line in LP815-43 ([Fe/H]=-2.7). From Asplund et al. 2006 (ApJ, 644, 229)



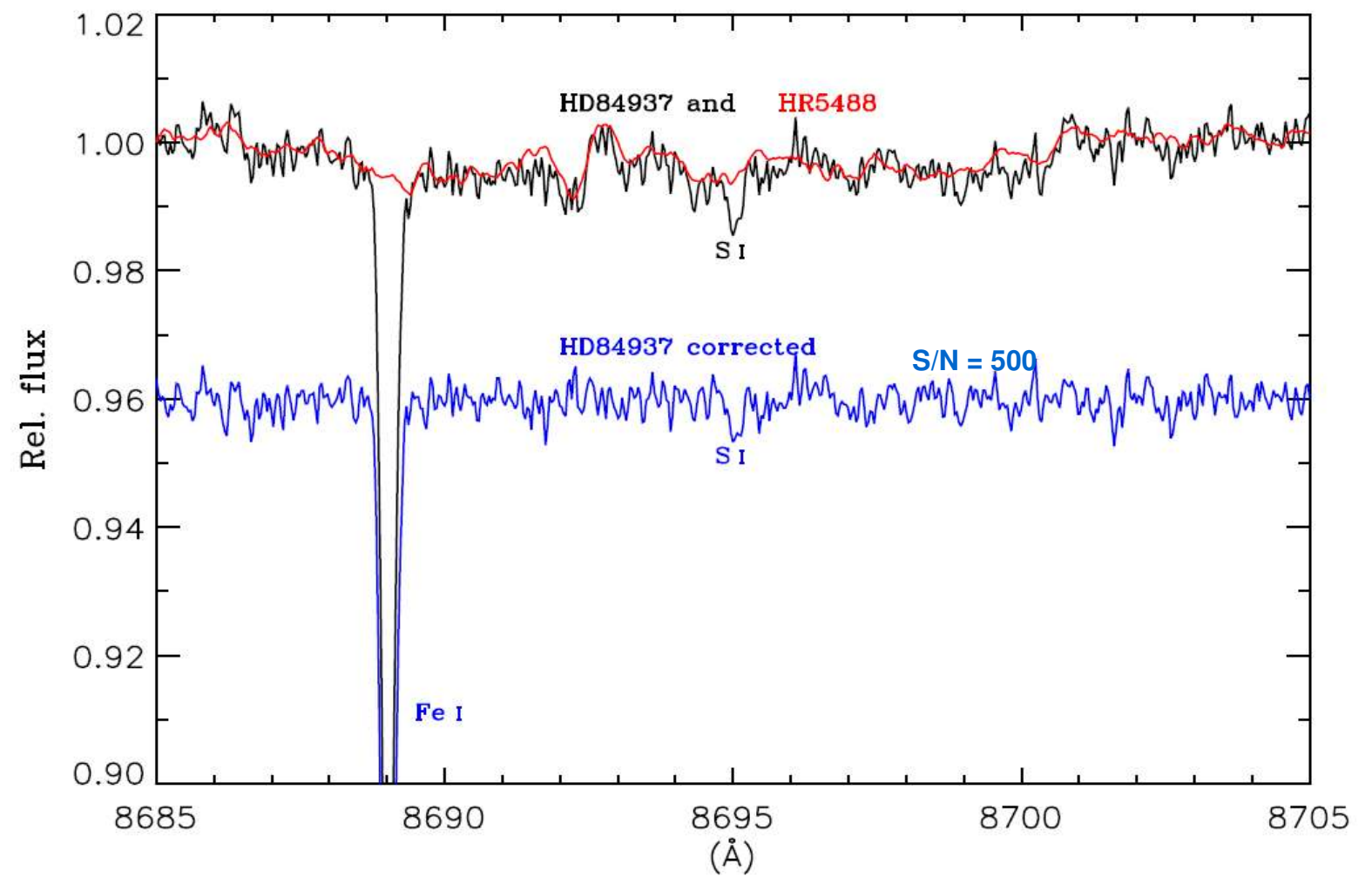
Residual fringing problem in BD+03 740 (RV= 199.4 km/s).
5-pixel smoothed spectrum of HR3239 (B1.5V) overplotted.



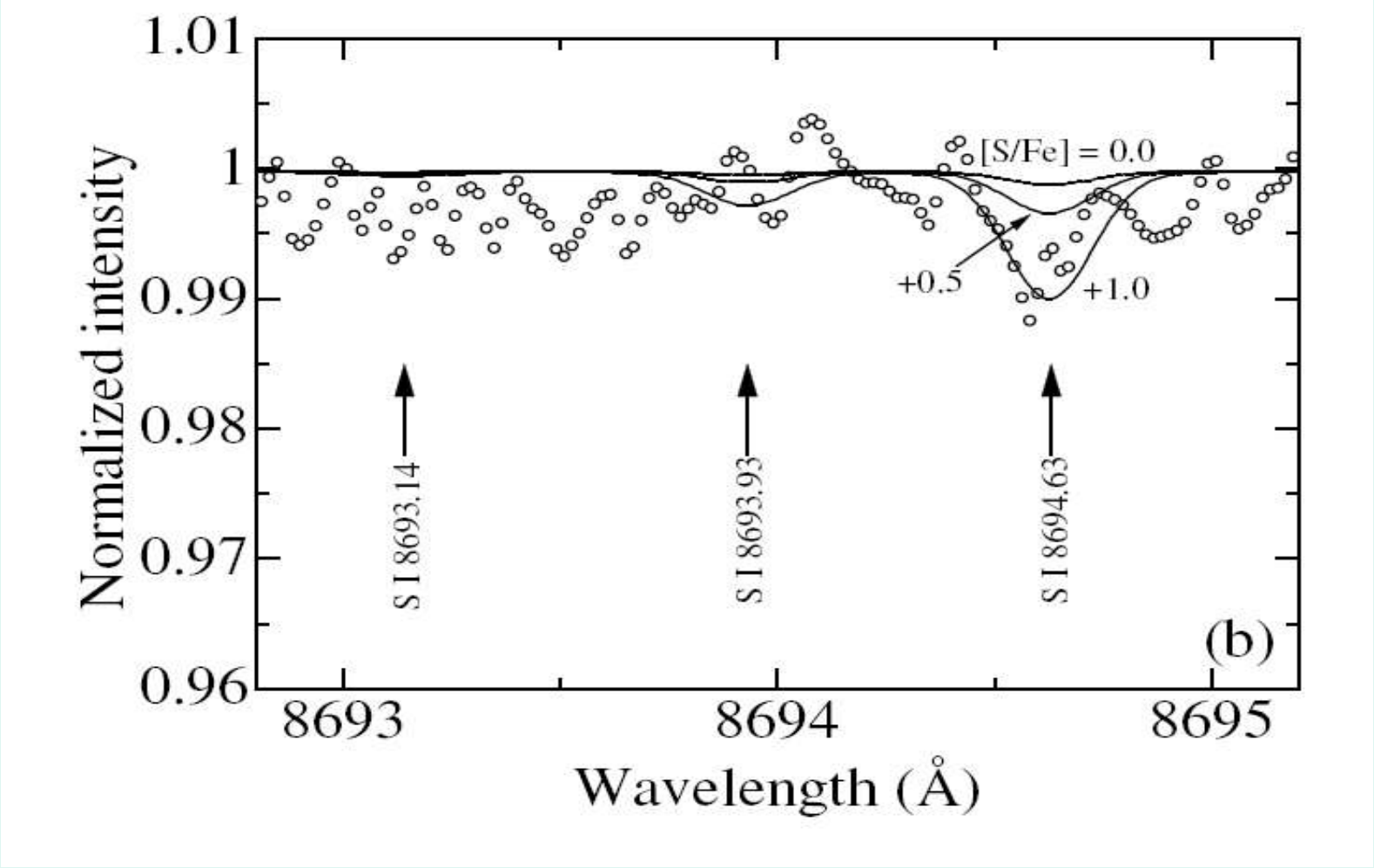
[S/Fe] vs. [Fe/H] for F and G dwarf stars.
Caffau et al. 2005 (A&A 441, 553)



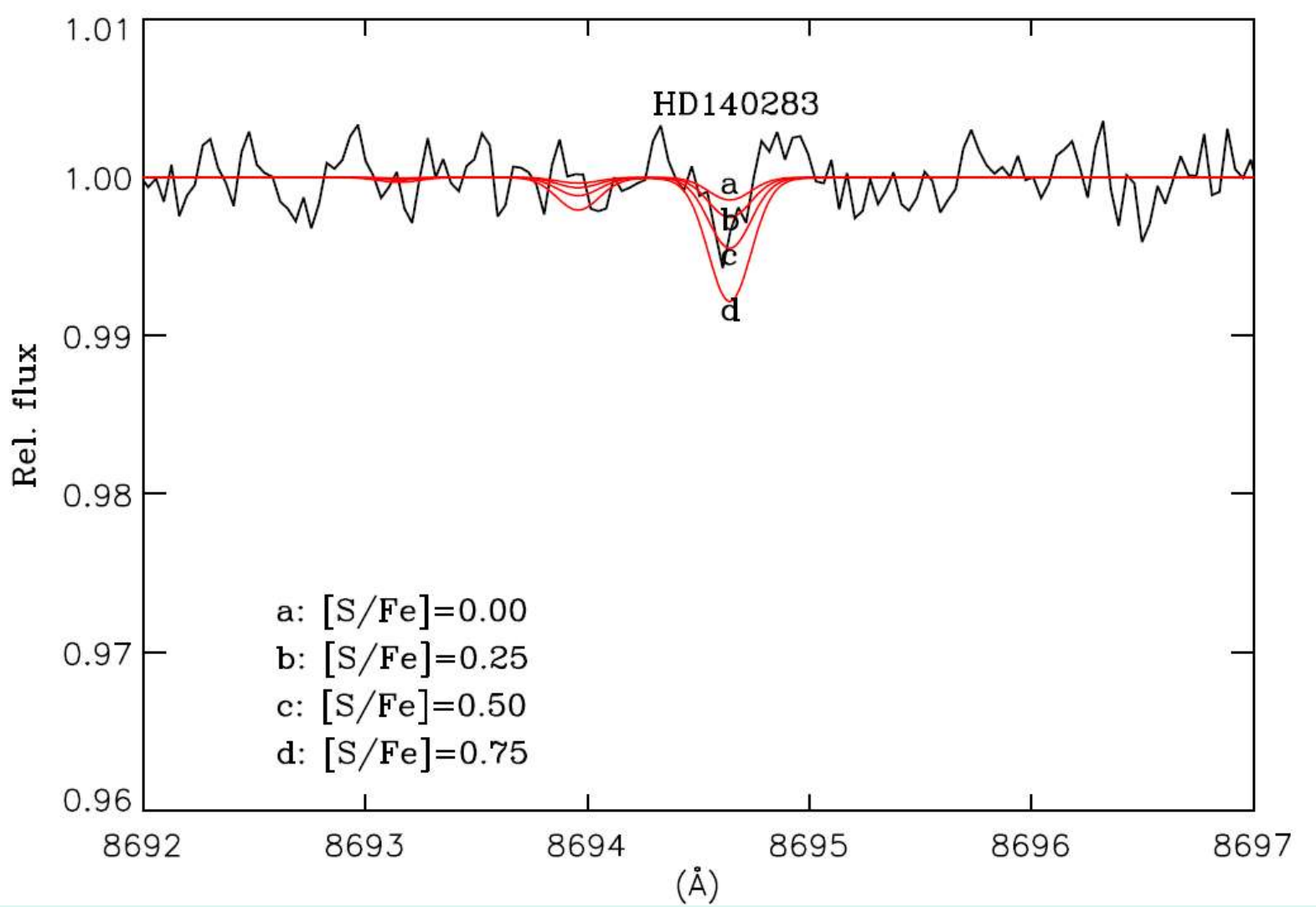
VLT/UVES spectrum of HD84937 (Teff=6360 K, logg=4.1, [Fe/H]=-2.1).
Comparison star HR5488 (B2III, Vsini=53 km/s). Residual fringing problem!



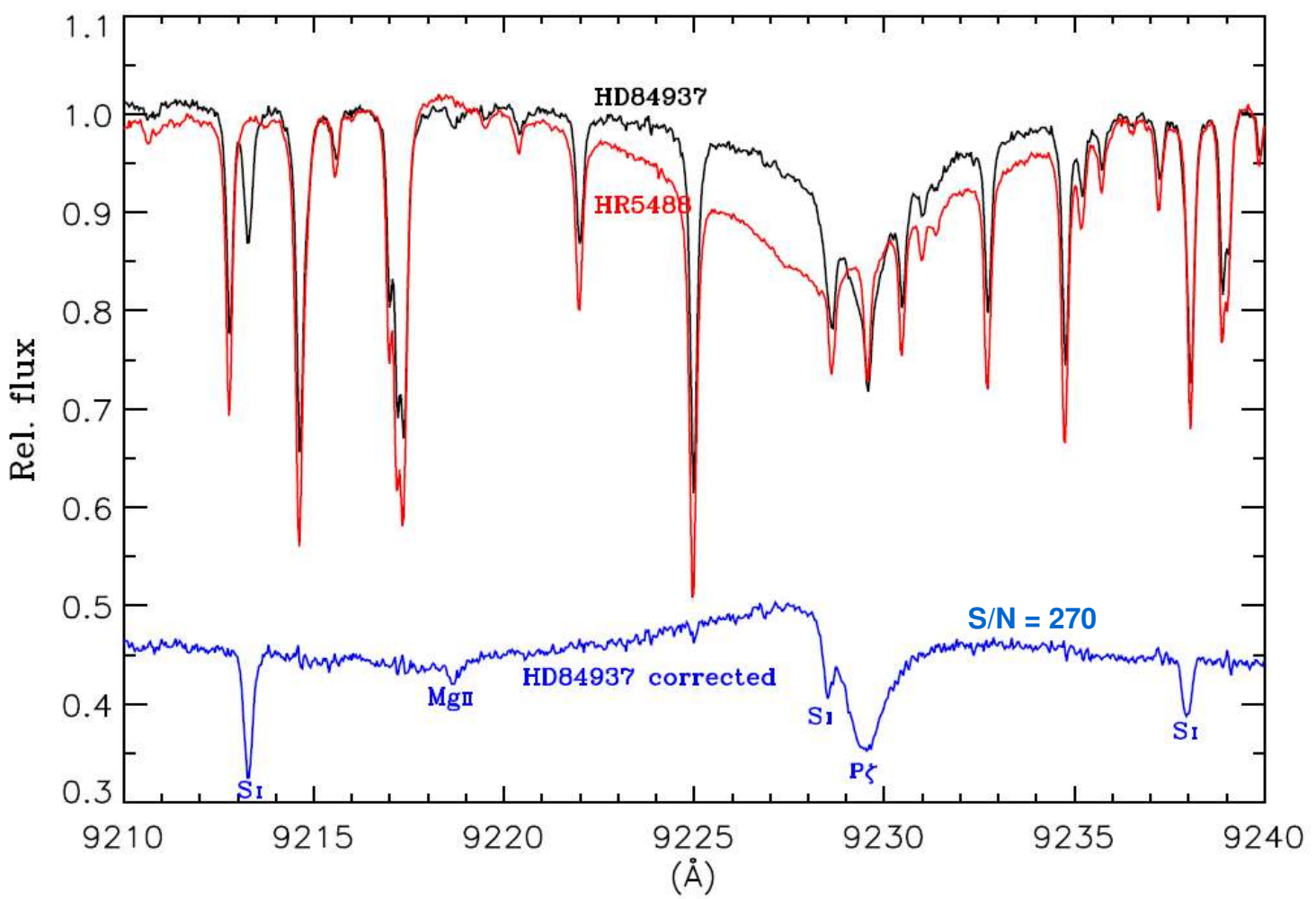
Synthesis of the UVES Paranal Observatory Project (POP) spectrum of HD140283 by Takeda et al. 2005 (PASJ 57, 751). Continuum has been set too high, and there seems to be residual fringing effects.



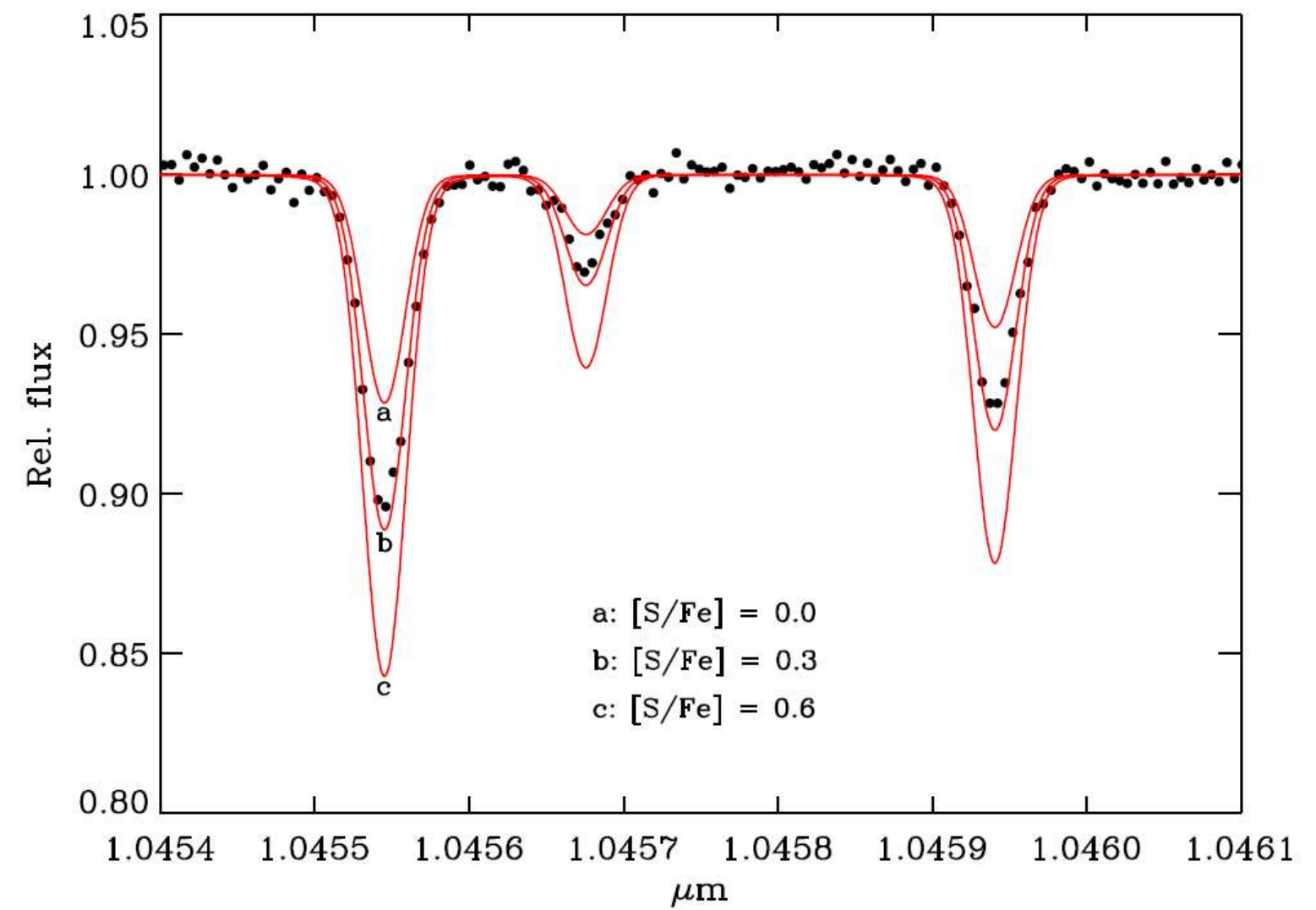
Synthesis of the SI 8694.54 Å line in S/N=600 UVES spectrum of HD140283 (Teff=5850 K, logg=3.7, [Fe/H]= -2.4), Nissen et al. (2007)



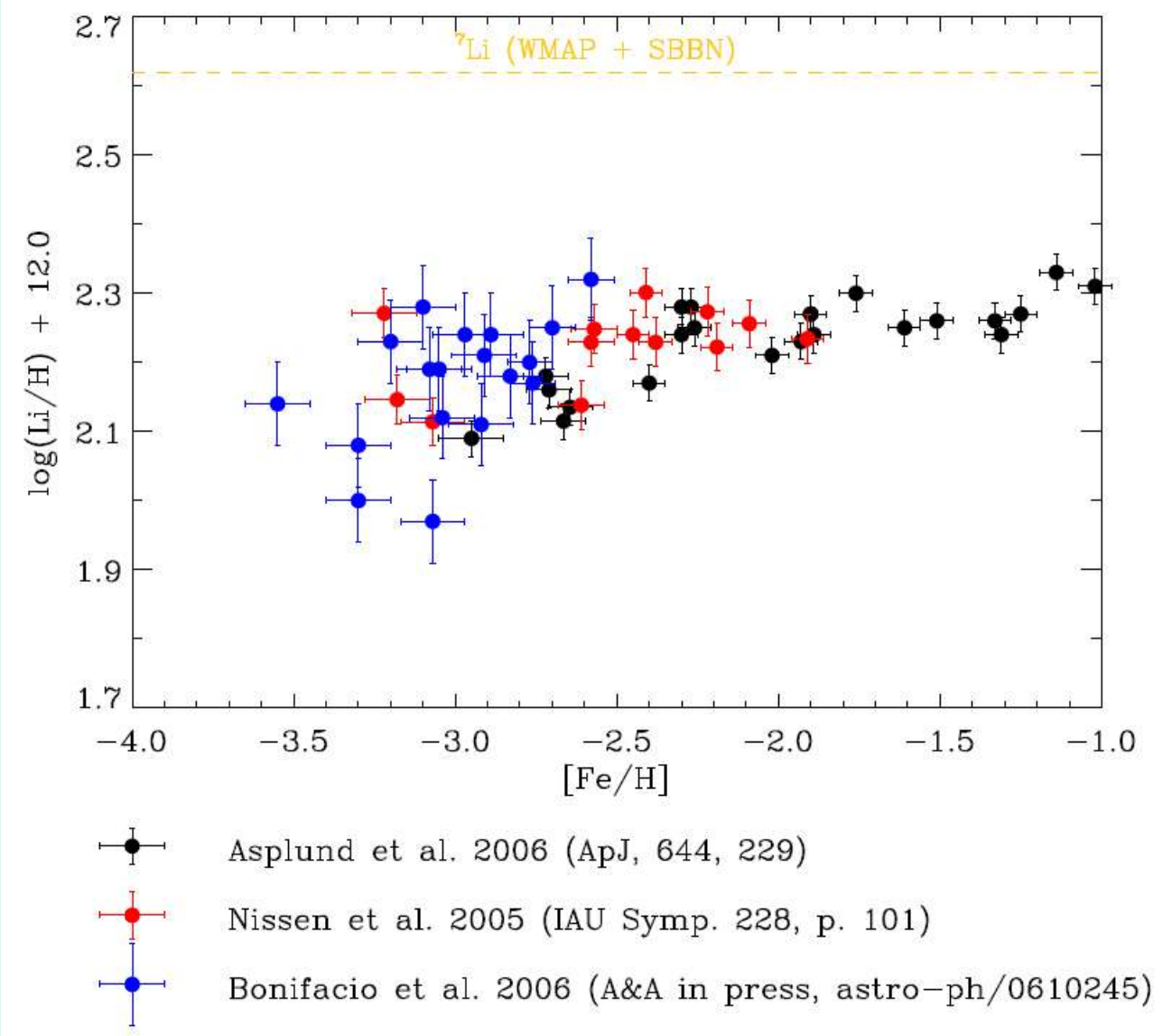
VLT/UVES (R=60.000) spectrum of HD84937 (Teff=6360 K, logg=4.1, [Fe/H]=-2.1). Comparison star HR5488 (B2III, Vsini=53 km/s)



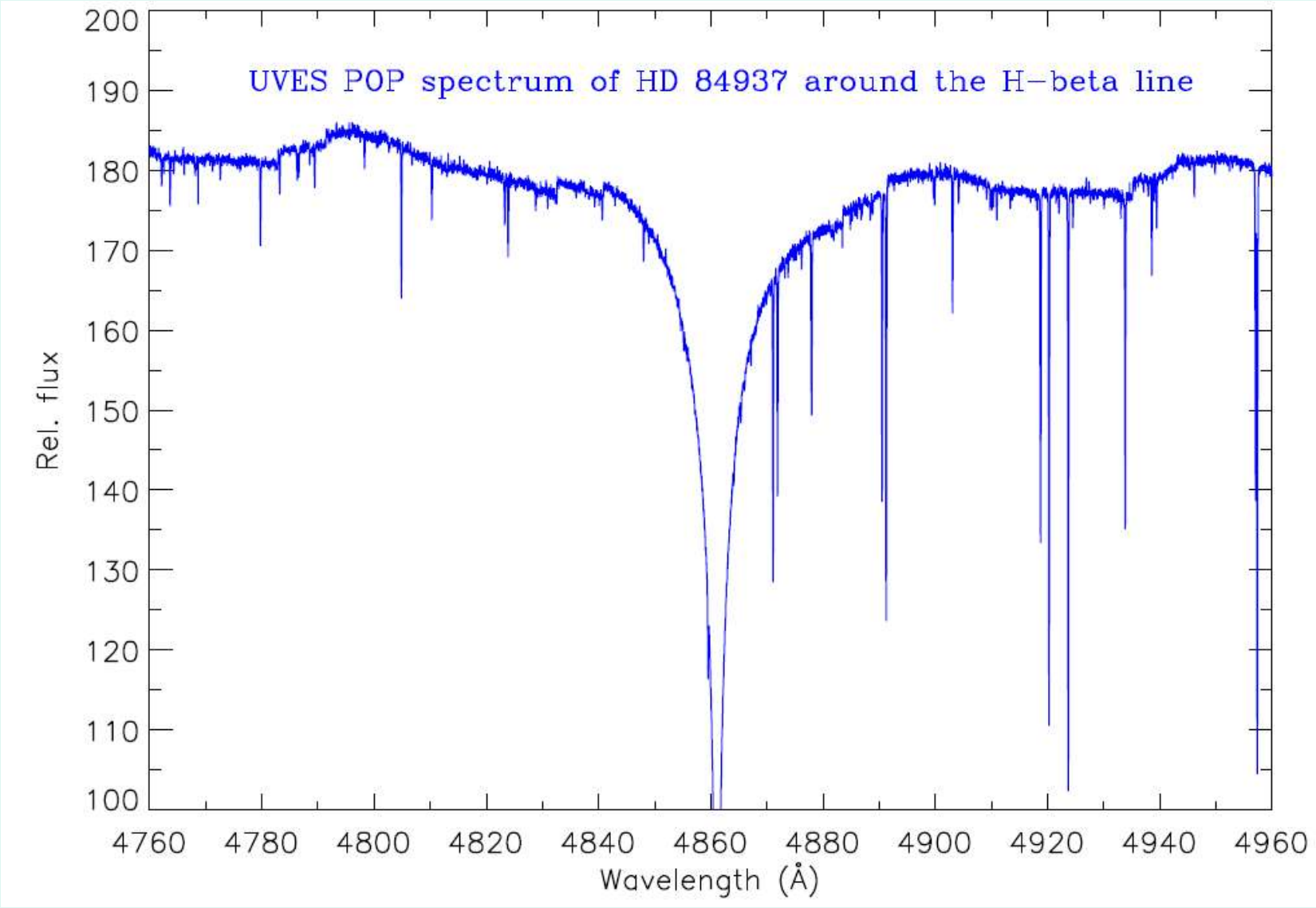
CRIRES spectrum (R=50000, S/N=330) of SI triplet in G29-23 (Teff=6190K, [Fe/H]=-1.7) compared to synthetic spectra for various [S/Fe] ratios.

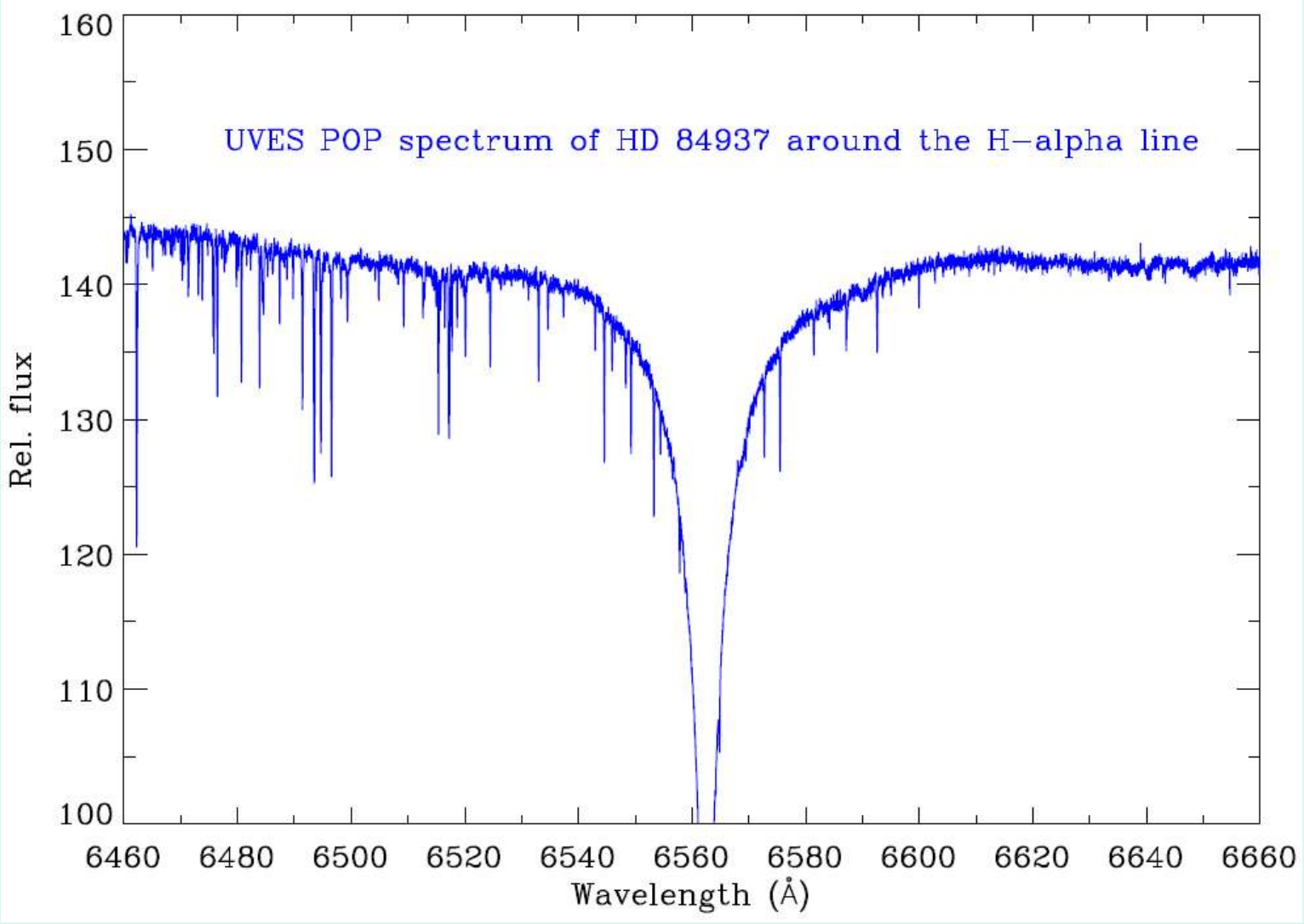


Lithium abundances in halo turnoff stars

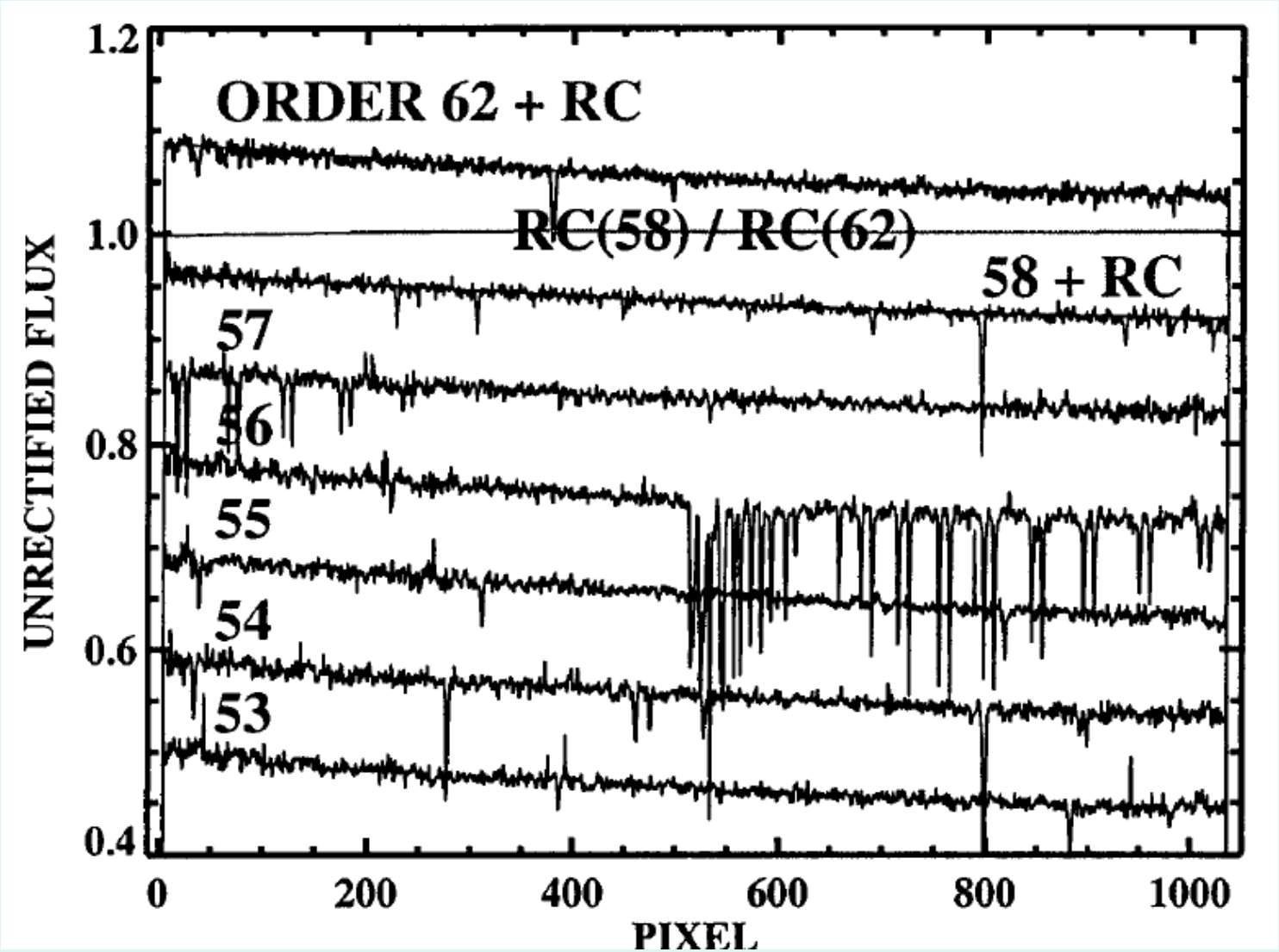


Flat-fielding problem in order-merged UVES spectrum

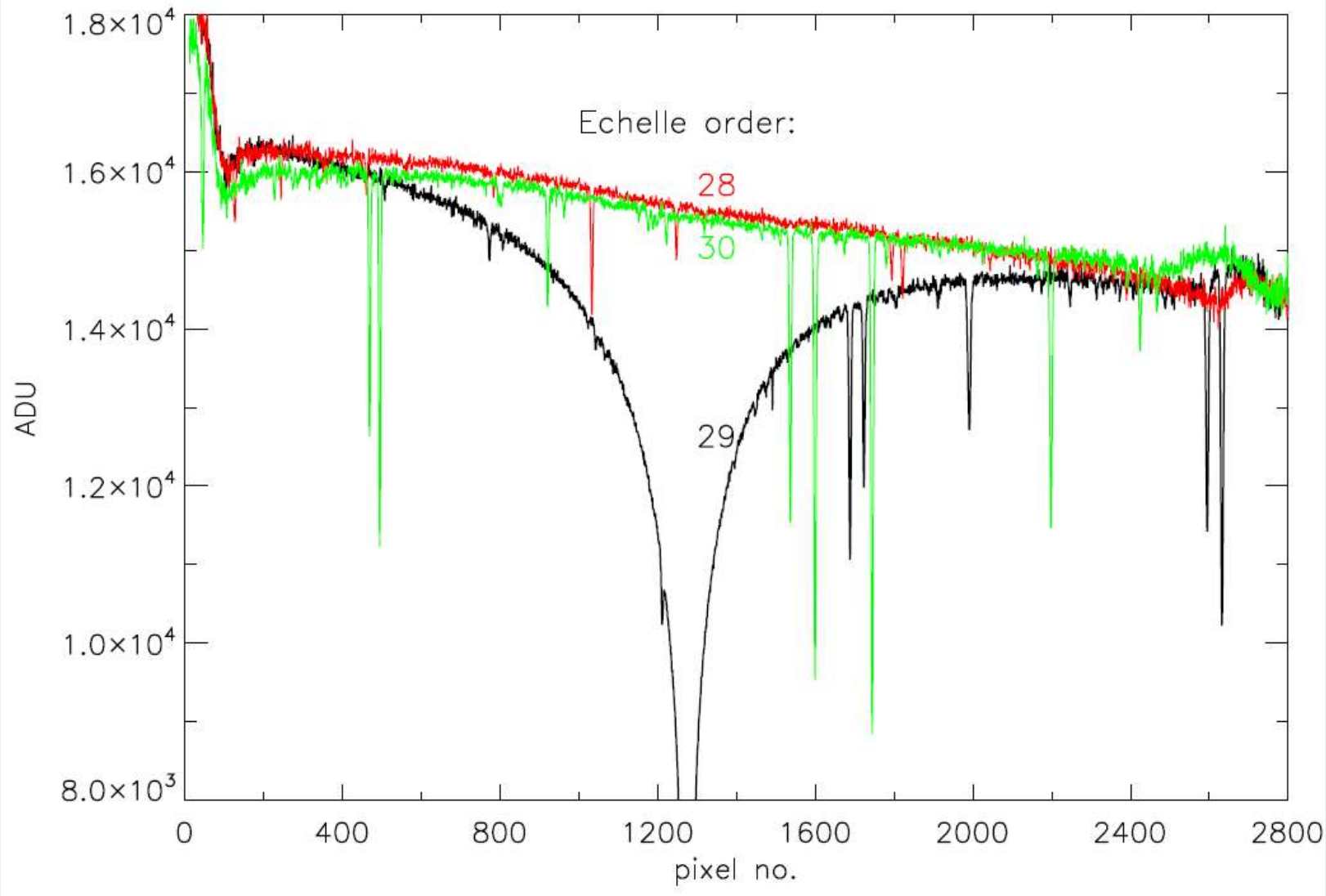



UVES POP spectrum of HD 84937 around the H−alpha line
Rel. flux
160
150
140
130
120
110
100
6460
6480
6500
6520
6540
6560
6580
6600
6620
6640
6660
Wavelength (Å)

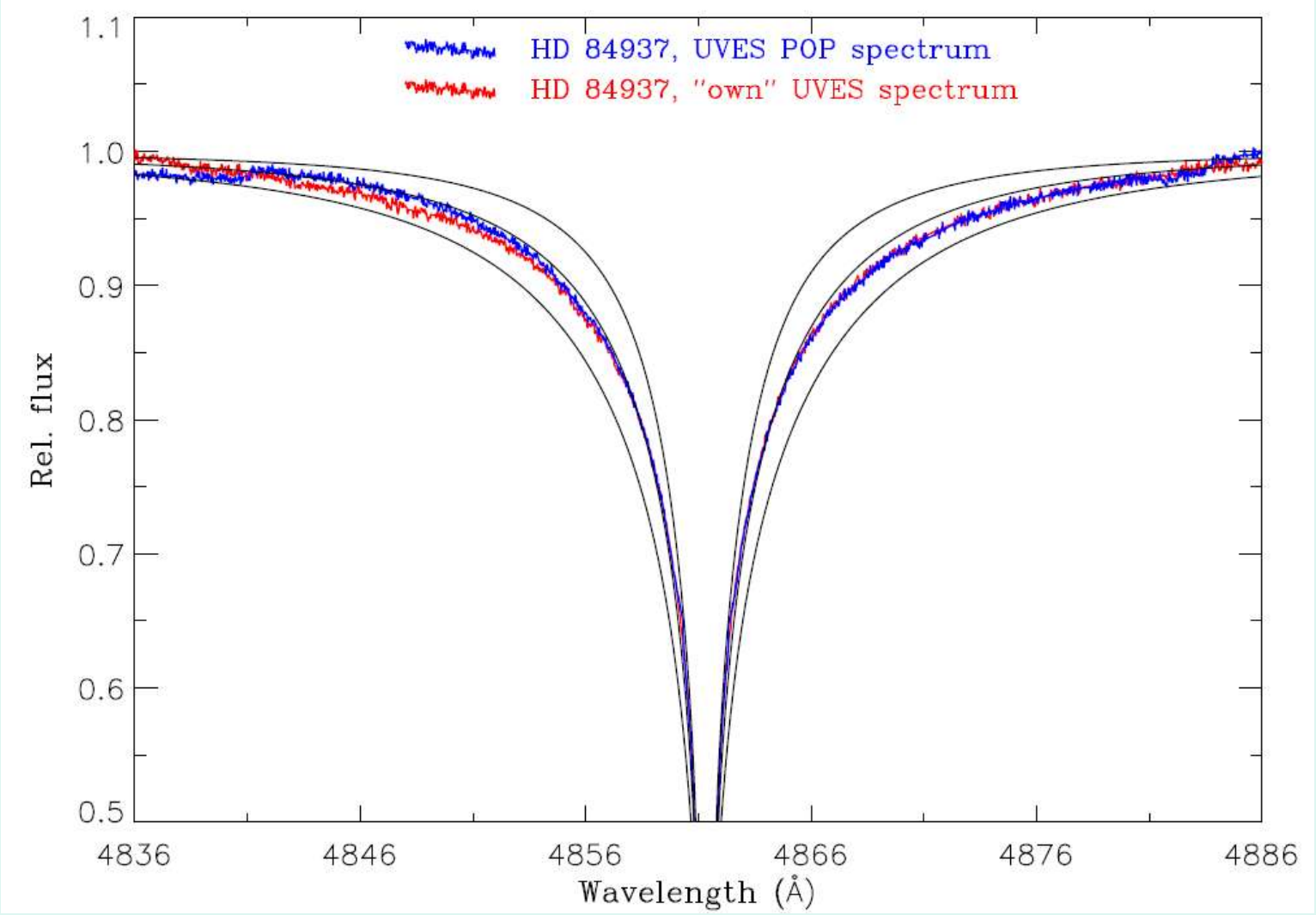
FOCES spectrum of BD-4 3208 in echelle orders around the Halpa order (60). From Korn 2002 (Proc. of “Scientific Drivers for ESO Future VLT/VLTI Instrumentation, ESO Astrophys. Symp. Ser., p.199)



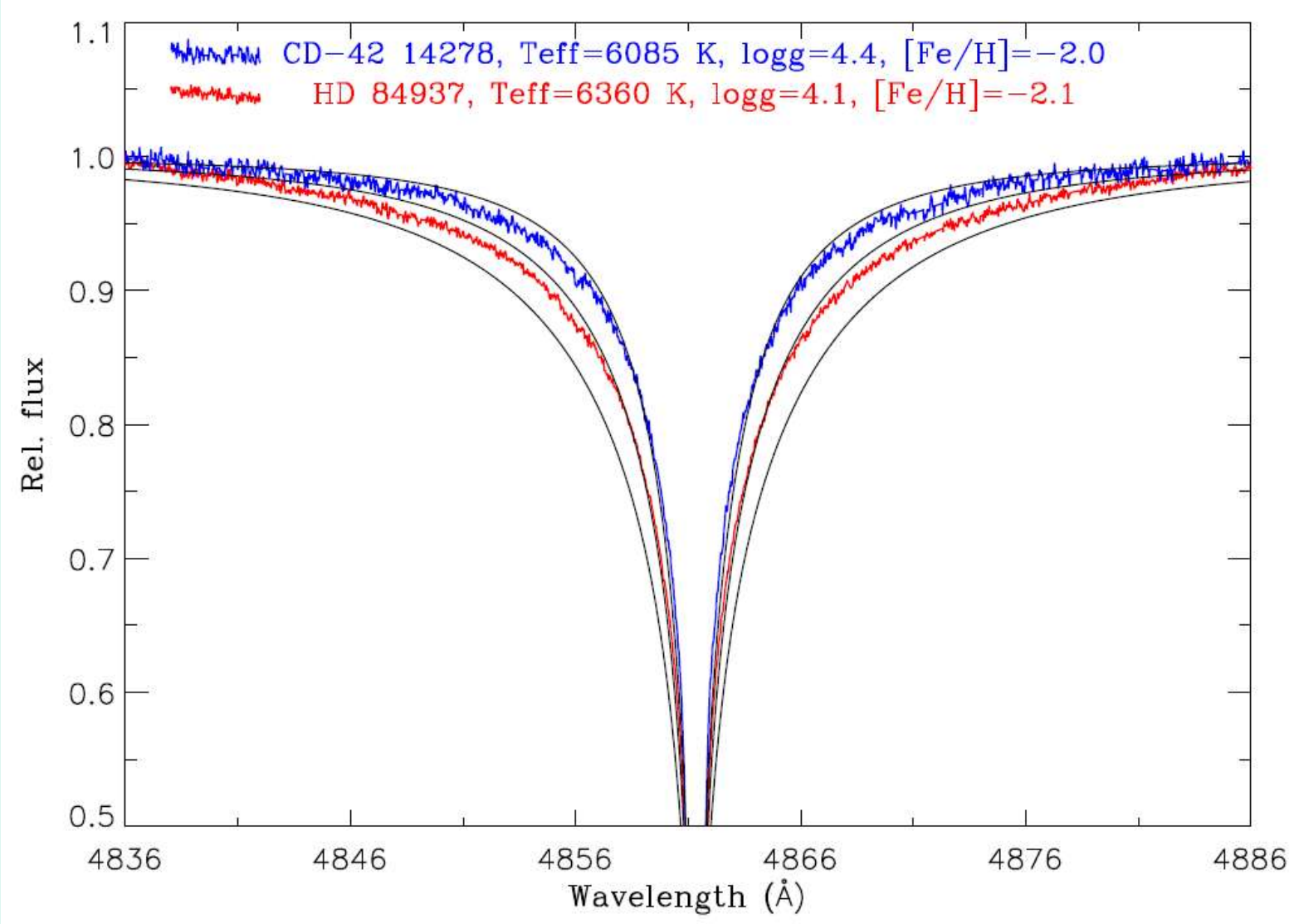
UVES spectrum of HD84937 in echelle orders around the H-beta line



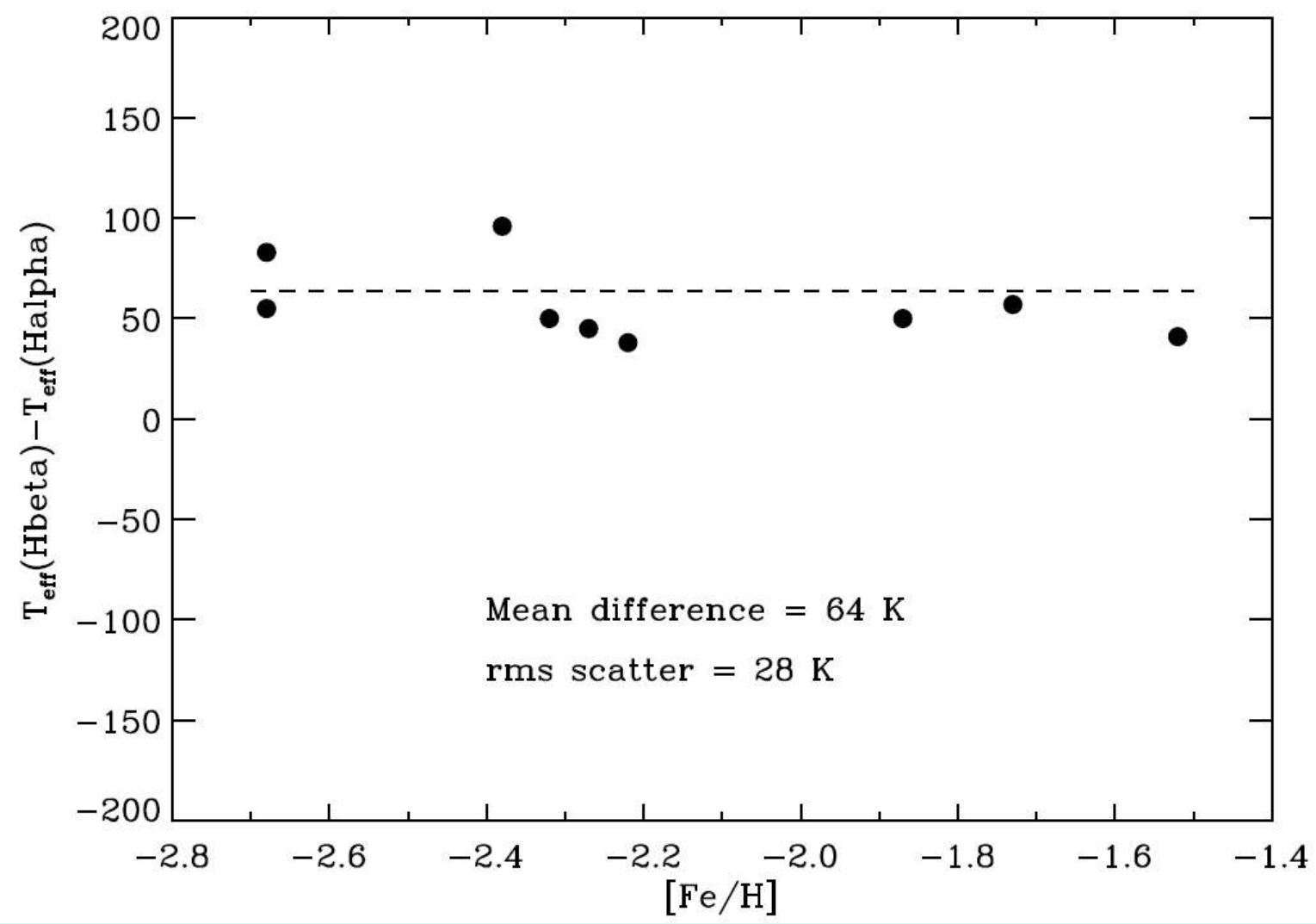
UVES spectra compared to synthetic H-beta profiles with Teff=6000, 6300 and 6600 K calculated for MARCS model atmospheres and Barklem et al. (2002) broadening theory



UVES spectra of CD-42 14278 and HD84937 compared to synthetic H-beta line profiles for Teff = 6000, 6300 and 6600 K



Comparison of effective temperatures of turnoff halo stars derived from UVES profiles of the Hbeta and Halpha lines.



Desiderata:

- Good flatfielding for the whole range of the echelle orders
- Suppression of fringes in red spectral region
- Higher efficiency in near-IR region
- Improved wavelength stability

New fiber-fed high-resolution spectrograph in the VLT combined focus