Empirical improvement of synthetic stellar spectra in the spectral regions of strong Diffuse Stellar Bands

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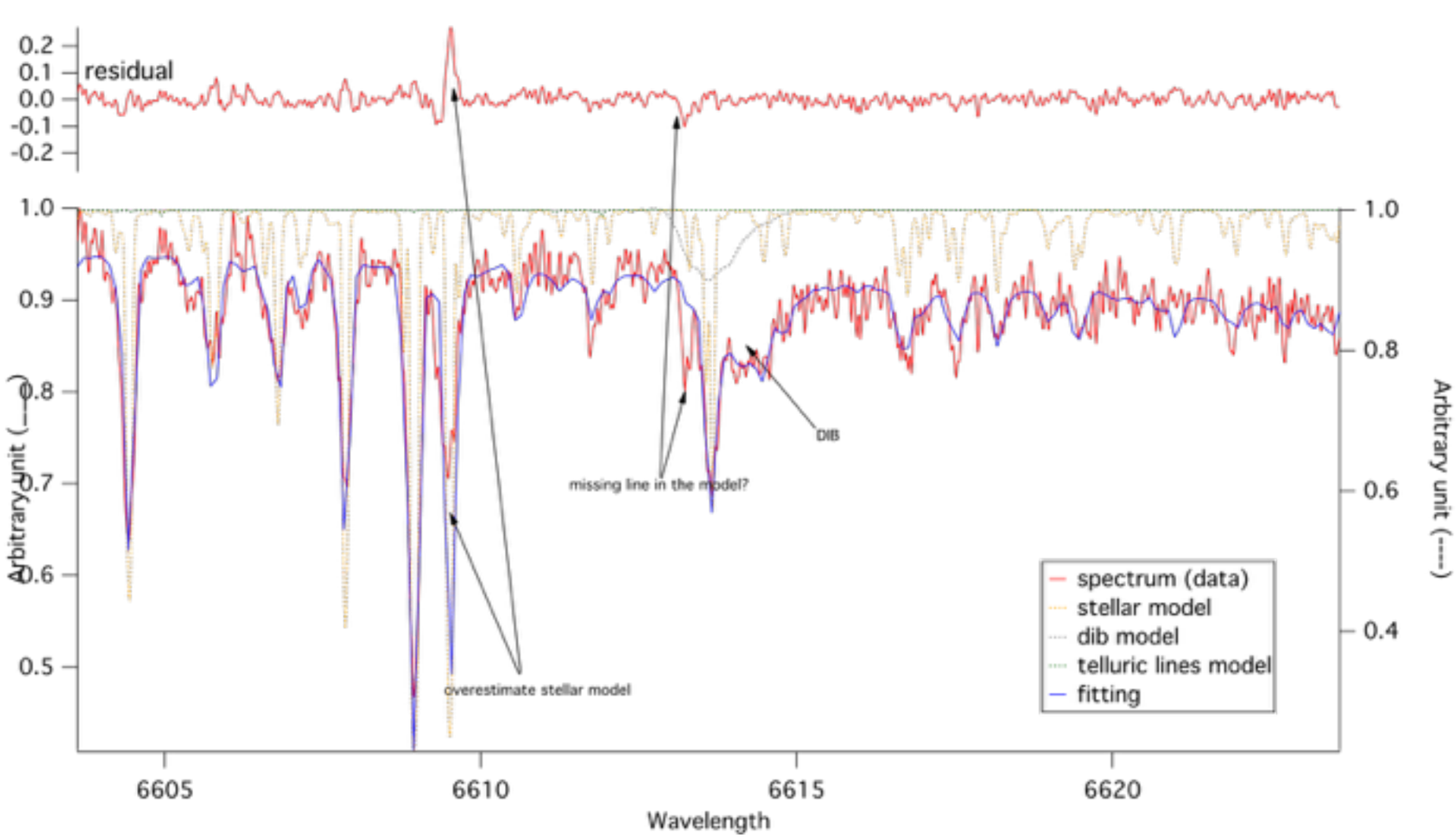
Motivation

- Diffuse Interstellar Bands (DIBs) are useful tracers of Galactic Interstellar Medium (ISM) structure.

- The abundant spectra of cool-stars in on-going and foreseen surveys constitute a juicy set of data to extract this information.

- Modeling of these spectra is challenging and not optimized in the spectral ranges of the DIBs.



We need to fix the line list

The tools

- Spectral ranges
  - 6186 - 6214 Å
  - 6259 - 6303 Å
  - 6369 - 6389 Å
  - 6604 - 6624 Å

- Stars
  - The Sun
  - Arcturus

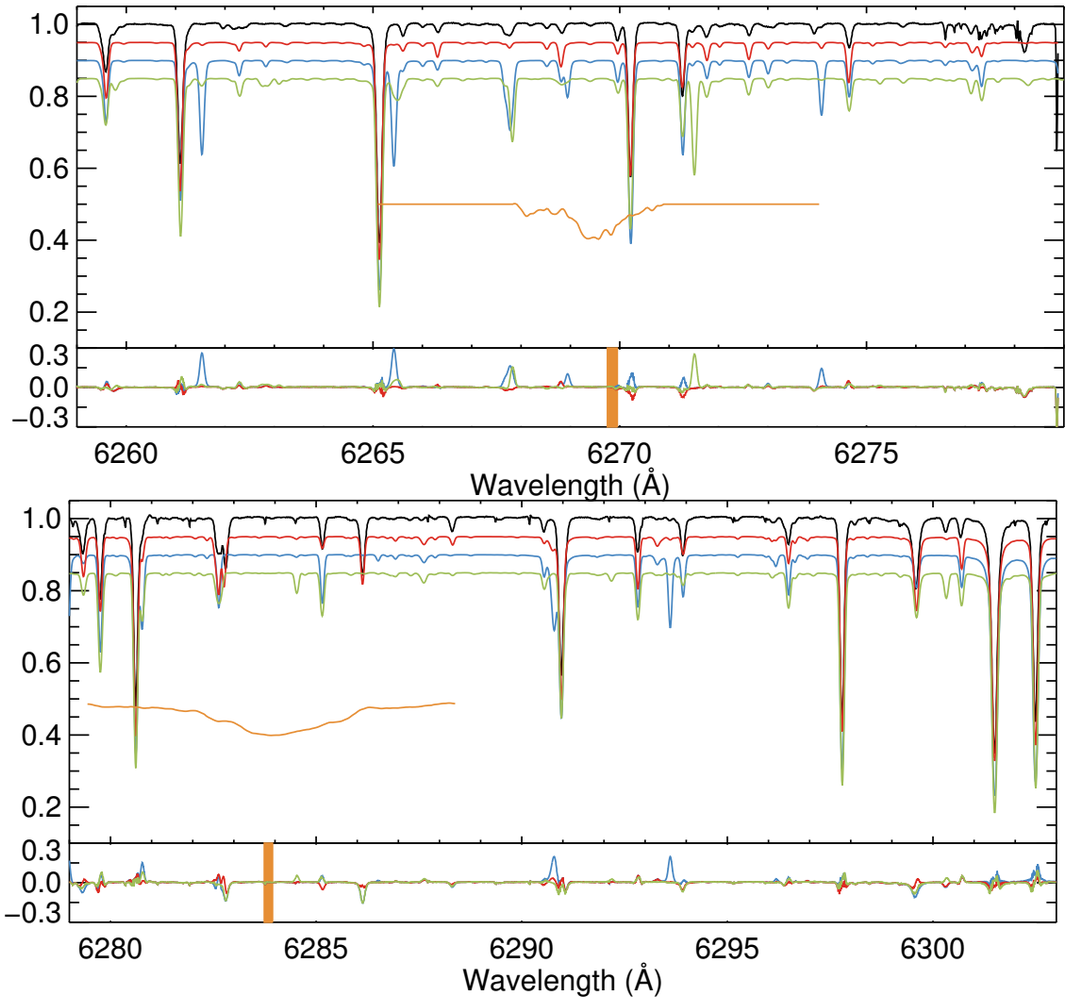
- Codes
  - MARCS / TURBOSPECTRUM
  - ATLAS 9 / SYNTHE

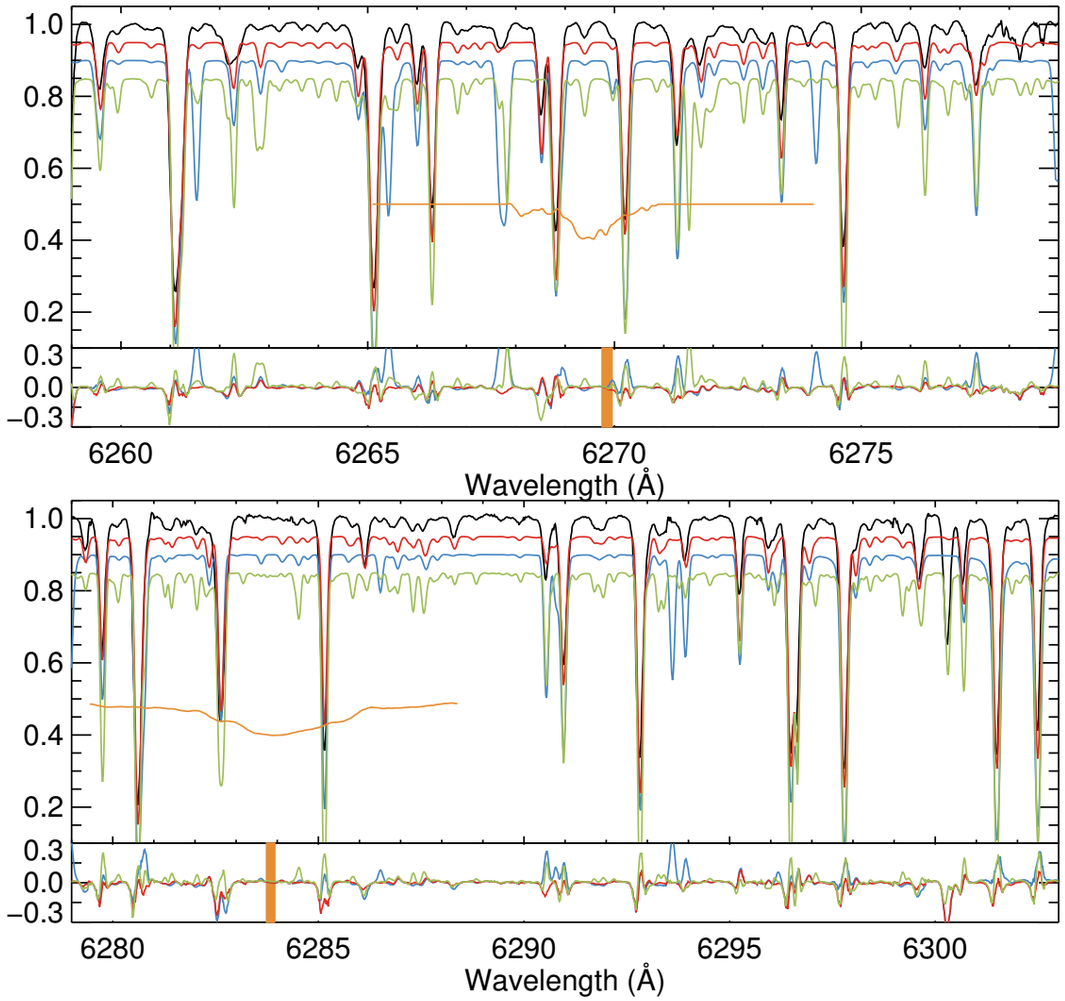
DIB
6196.0
6269.8
6283.8
6379.3
6613.6

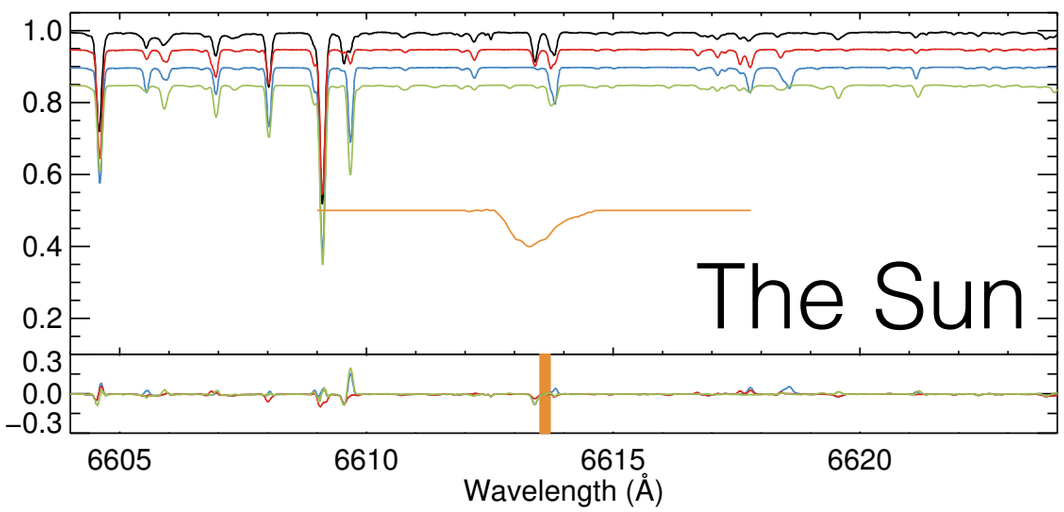
The corrections

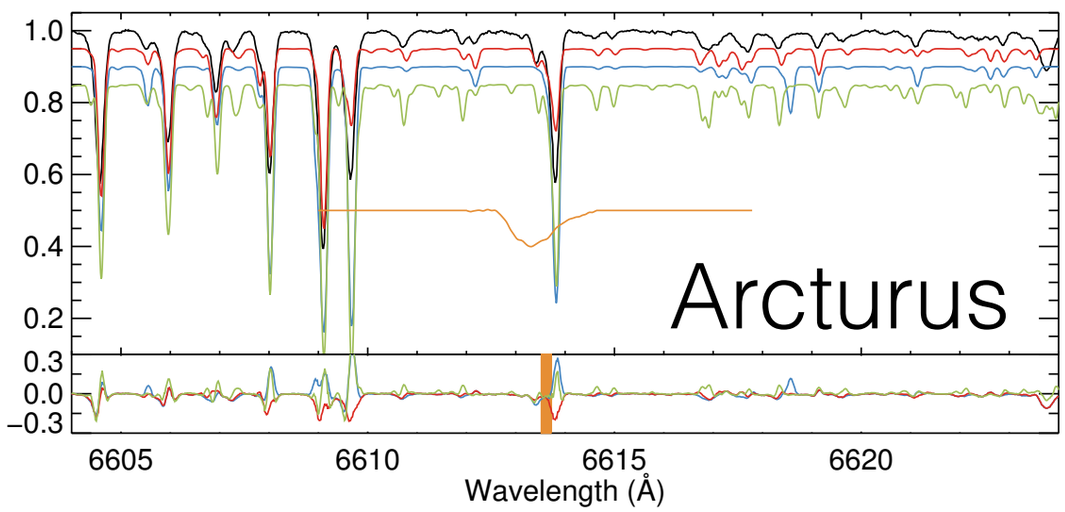
Data
Atlas Synspec
TurboSpec + Vald 3, Original
TurboSpec + Vald 3, Corrected

DIB center for
v_{DIB} = 0 km/s









The application: example of a fit