

The MARCS Grid of Theoretical Model Atmospheres

This is a grid of one-dimensional, hydrostatic, plane-parallel and spherical LTE model atmospheres. These may be used together with atomic and molecular spectral line data and software for radiative transfer to generate synthetic stellar spectra.

The MARCS site contains some 37,000 stellar atmospheric models of spectral types F, G, and K and sampled surface fluxes. The data files are downloadable in the form of tar archives. The basic reference describing the models is: [Gustafsson B., Edvardsson B., Eriksson K. et al. 2008, *Astronomy & Astrophysics* 486, 951.](#)

Abundance mixtures

The models were originally made for our own needs to make abundance analysis from stellar spectra. Therefore there are different “flavours” of the models, e.g., model groups with different relative fractions of metals intended to represent different stellar populations.

The “standard” composition models represent the metal-poor α -element-rich halo, the metal-rich disk, and a transition between these populations in the metal-poor disk.

There are also subgrids of giant star models with abundances representing mild and heavy dredge up of CN-cycled material as well as grids of α -element-enhanced and α -element-poor models.

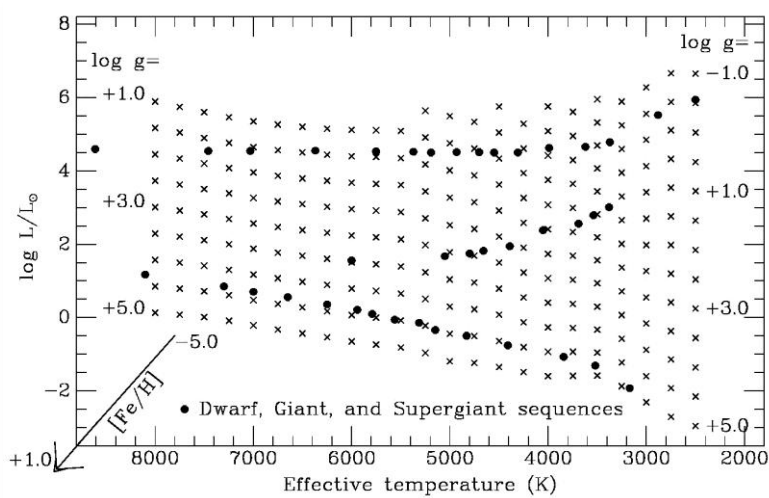


Fig. 1: The theoretical HR diagram with a subgrid of models indicated by crosses. Overlaid are standard luminosity class sequences.

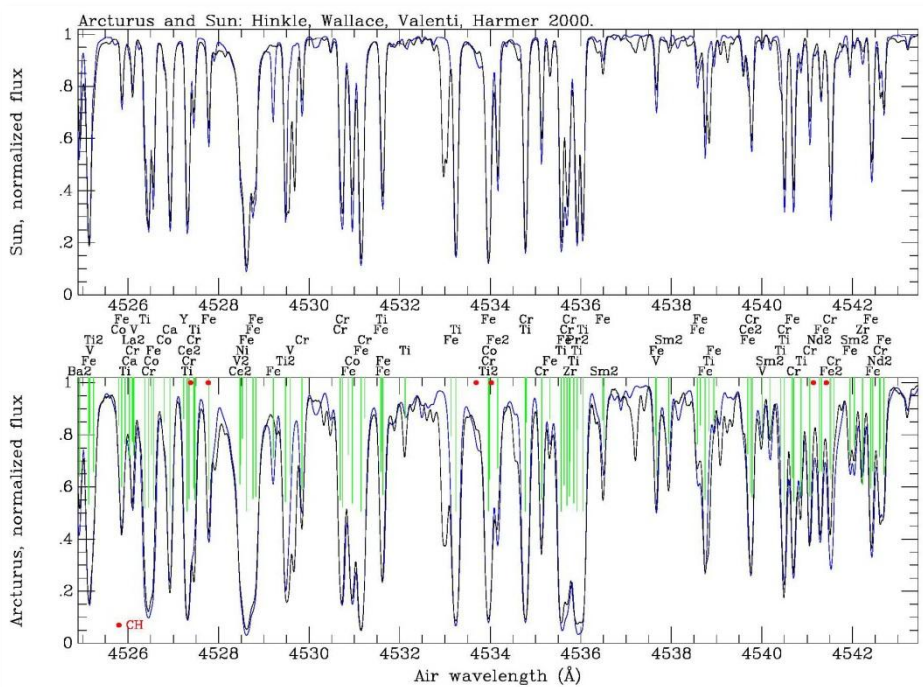


Fig. 2: A small part of the spectra of the Sun and Arcturus with synthetic spectra computed from MARCS models overlotted (in blue).

The uses of the MARCS grid

The models are often requested by individual users. During 2010 125 users downloaded more than 25000 individual models. The whole grid of models or sampled fluxes have also been requested for, e.g., telescope exposure time calculators and as components in other software. The number of citations to the [primary](#) publication is 239 in April 2011.