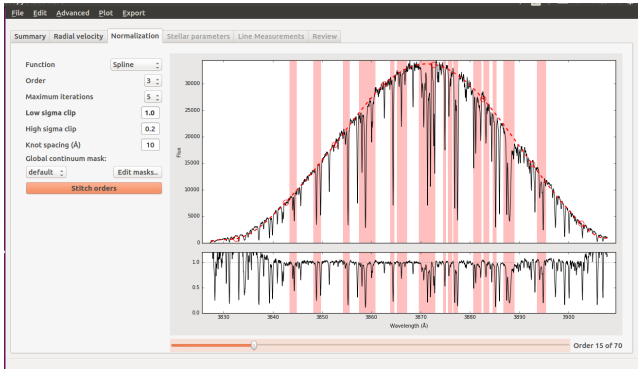
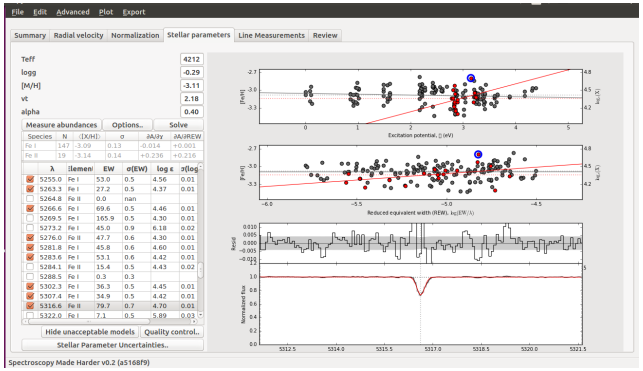
Stellar Photosphere Spectroscopy

Allen Marquez & Jose Arizmendi
East Los Angeles College
Physics Dept.

Mathematical Model/Normalization



Stellar Parameters



- Teff : Effective temperature of the star
- Log g : Surface gravity of the photosphere
- [M/H] =

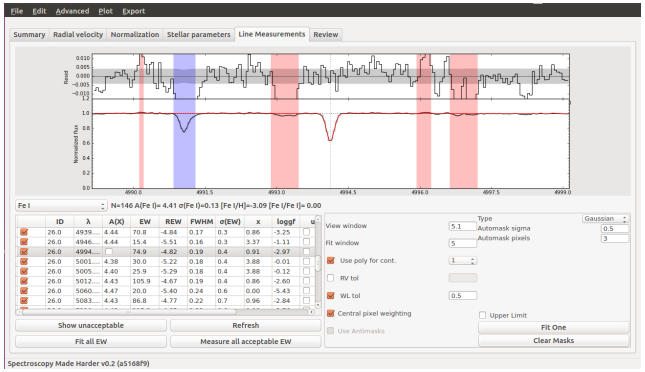
$$\log_{10}\left(\frac{N_M}{N_H}\right)_{star} - \log_{10}\left(\frac{N_M}{N_H}\right)_{Sun}$$

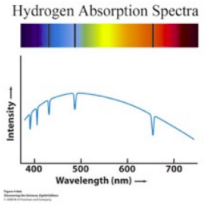
- Vt : Average velocity of the gas in the atmosphere

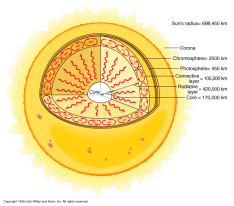
Abstract:

Determining the chemical abundances of stars observed by the Magellan Telescope by spectral analysis. Using theories of quantum mechanics we are capable of measuring the metallicity of the stellar atmosphere and thus gain insight into the evolution of the stars in the milky way—particularly the outliers. The Magellan has been observing outlying Hypervelocity stars and their chemical abundance of these stars will give insight as to their origin. As reference, the most extreme metal-poor star known (HD 122563). Metal poor stars are formed early on in the evolution of the stars in a universe that was not metal rich. The abundances are presented as ratios of one element to another and that is then taken with respect to our own Sun.

Equivalent Widths

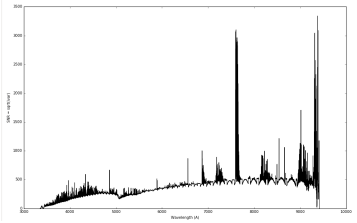






- A feature of the the absorption line with units of wavelength, from this we can calculate the abundance of elements that are absorbing at specific wavelengths, many factors are taken into consideration when determining the accuracy of the measurement—for noise is present and must be accounted for.

Signal to Noise Ratio:



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