Equivalent widths

- General methods
- Some examples

Equivalent widths are useful because can be easily converted into abundances, having a model atmosphere and the line parameters

Equivalent widths are independent of Vsini and Vmac broadening (you do not need to know Vsini and Vmac to measure abundances)

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- General methods
  - **Direct integration**
  - **Line profile fitting**
- Some examples

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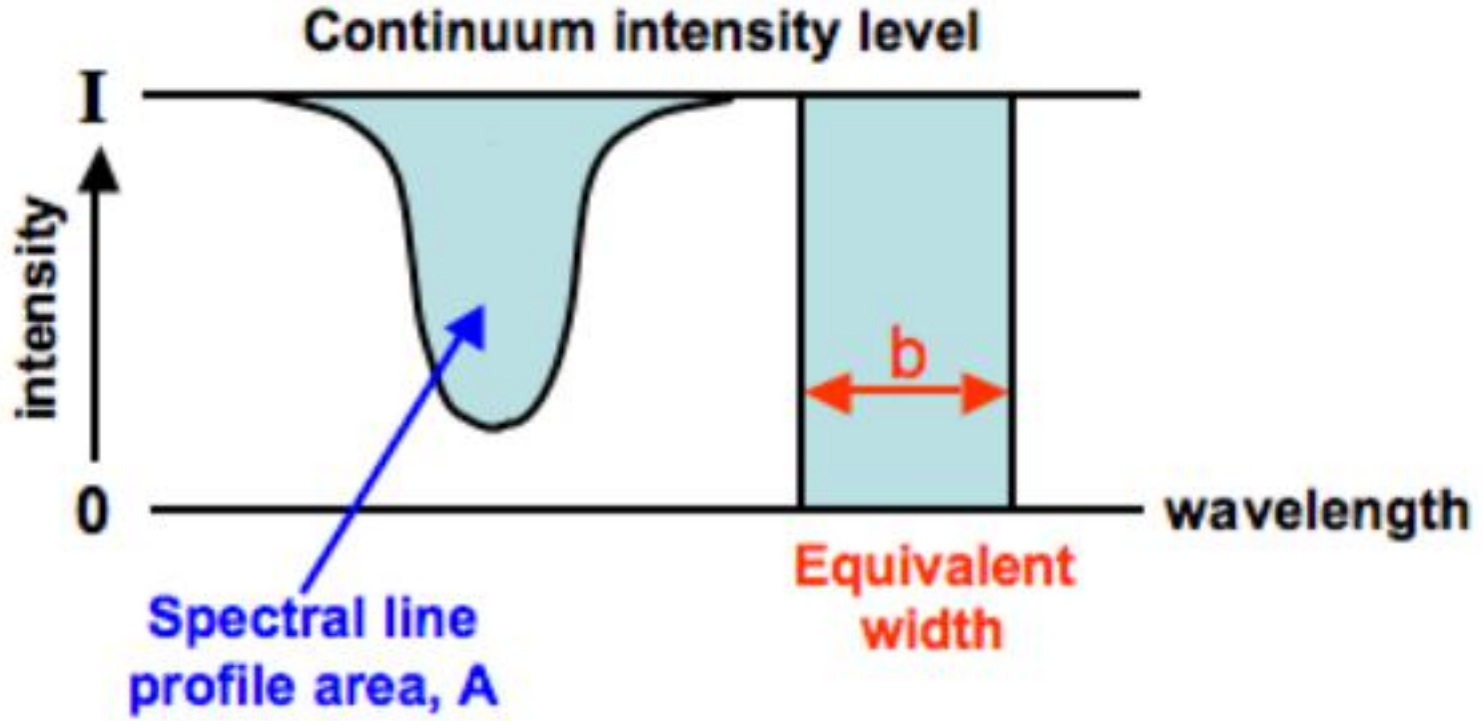
Equivalent widths: definition and direct integration

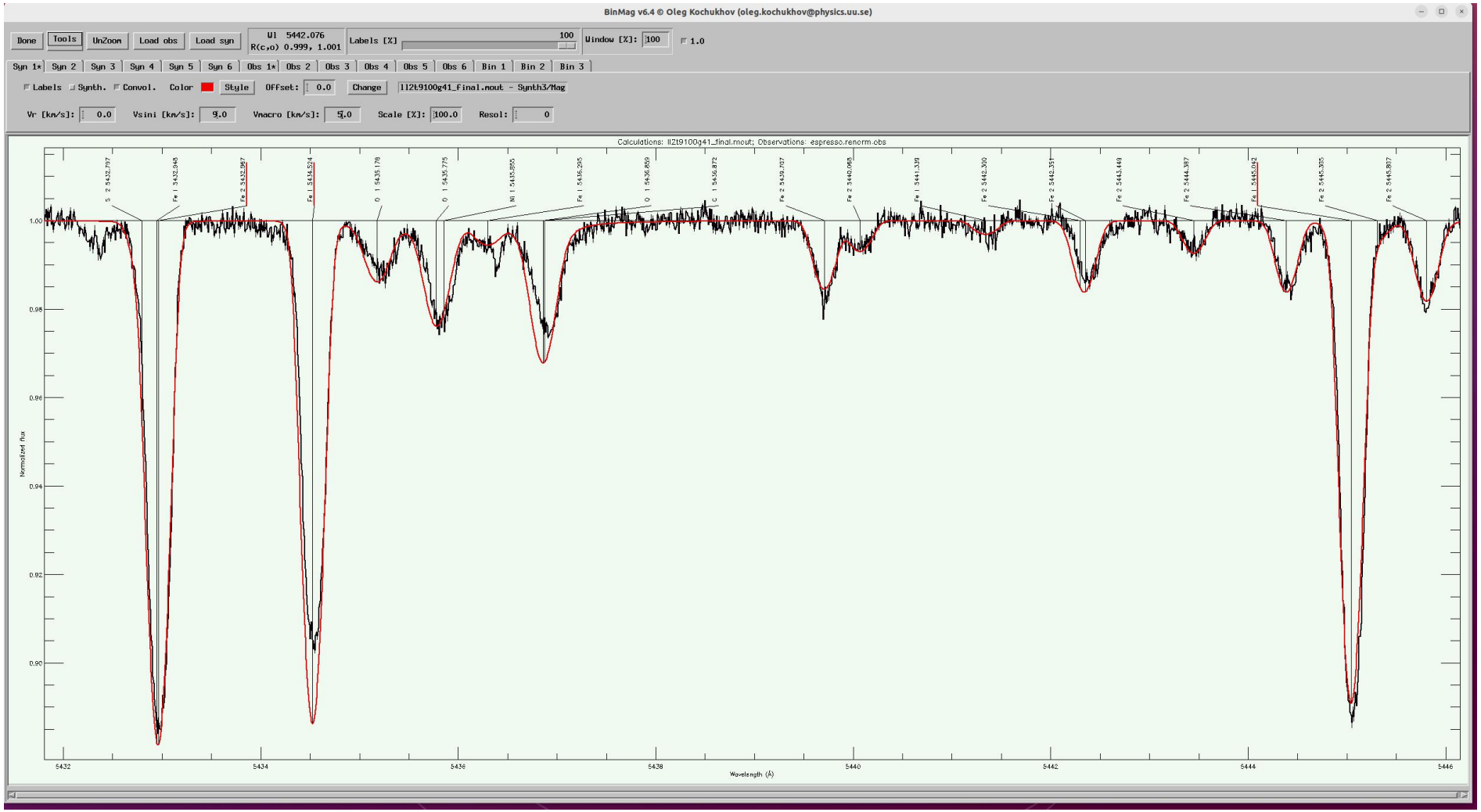


Equivalent widths are measured in milliAngstroms

One directly measures the area between a spectral line and the continuum

Equivalent widths: line profile fitting

Spectral lines are typically Voigt profiles (convolution between Gaussian and Lorentzian profiles), however in most cases they can be approximated by either a gaussian or a rotational profile or a mix of the two

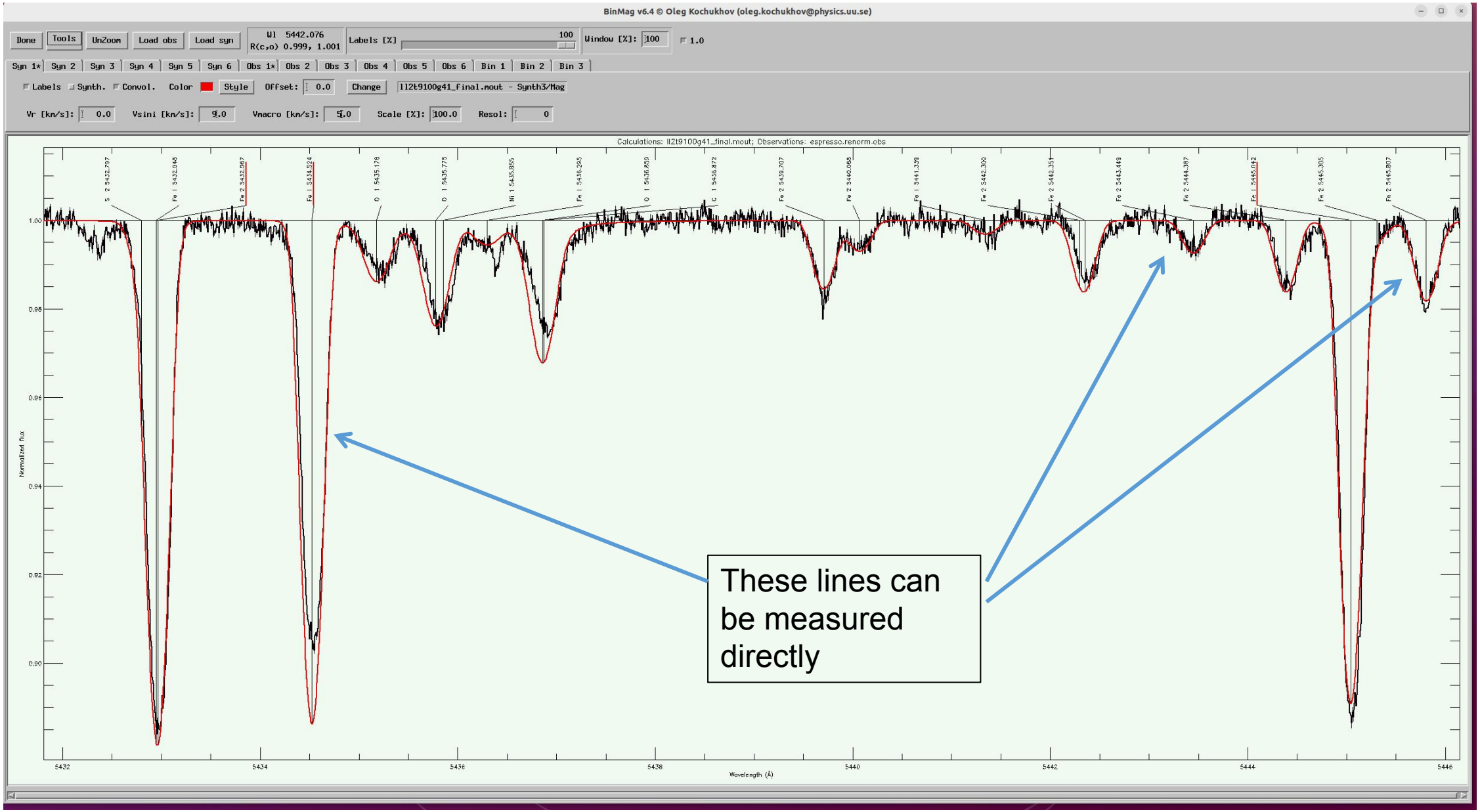


Binmag (IDL) by Oleg

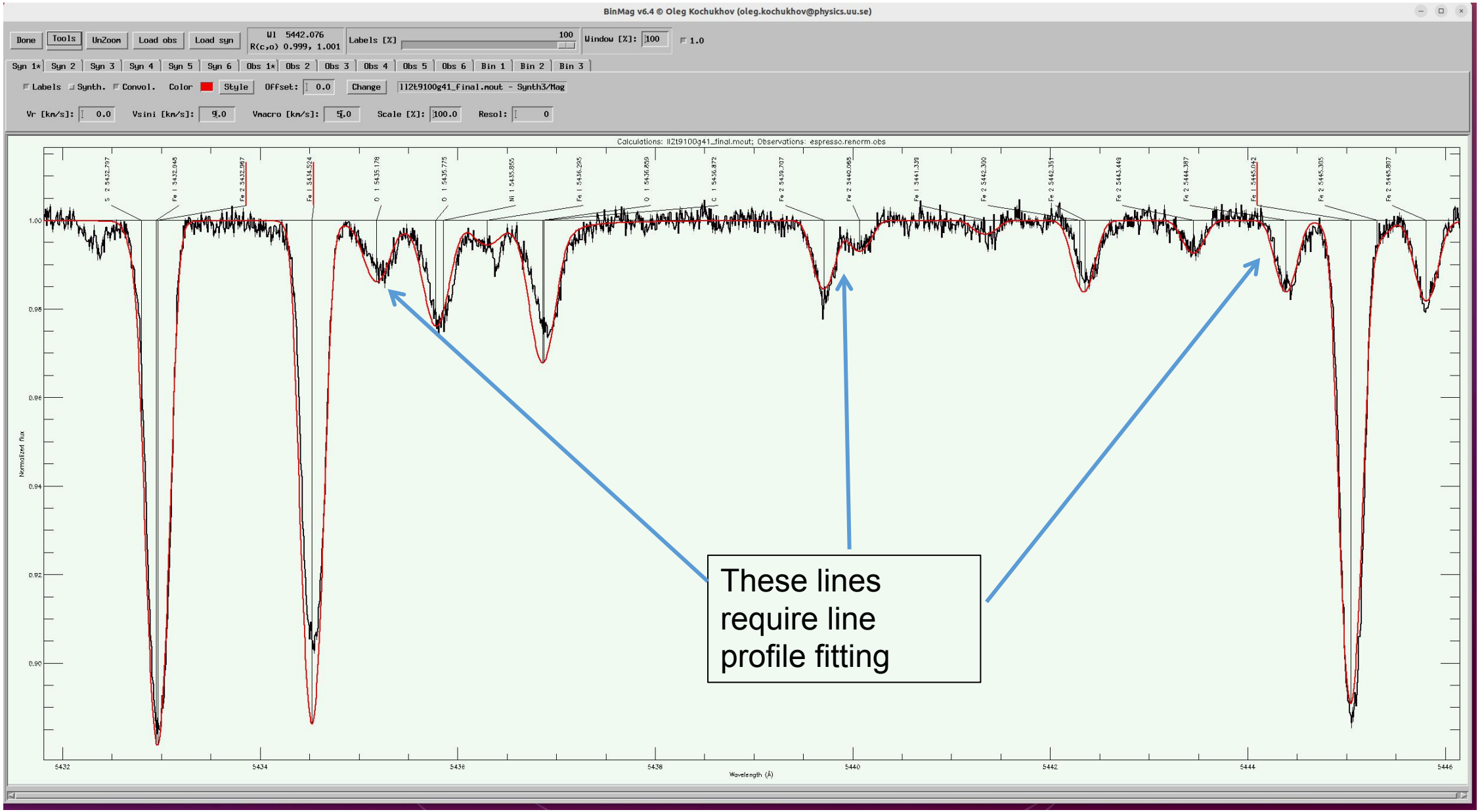
https://www.astro.uu.se/~oleg/binmag.html

Visualisation, fitting of various parameters (e.g. Vr, Vsini, Vmac), measure equivalent widths using different methods, excellent for handling SB2, interface to SME for parameter and abundance determination

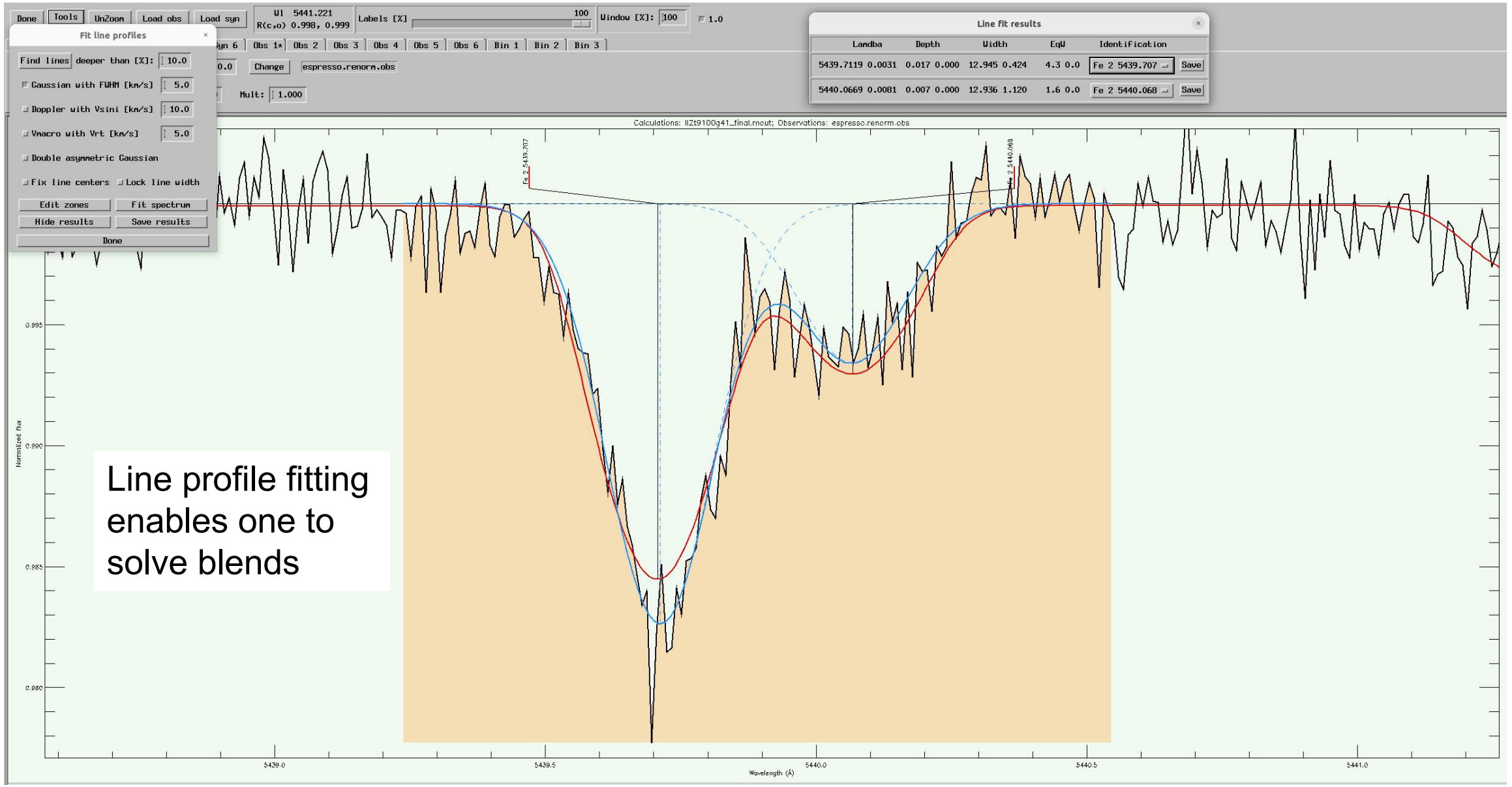
Equivalent widths: line profile fitting



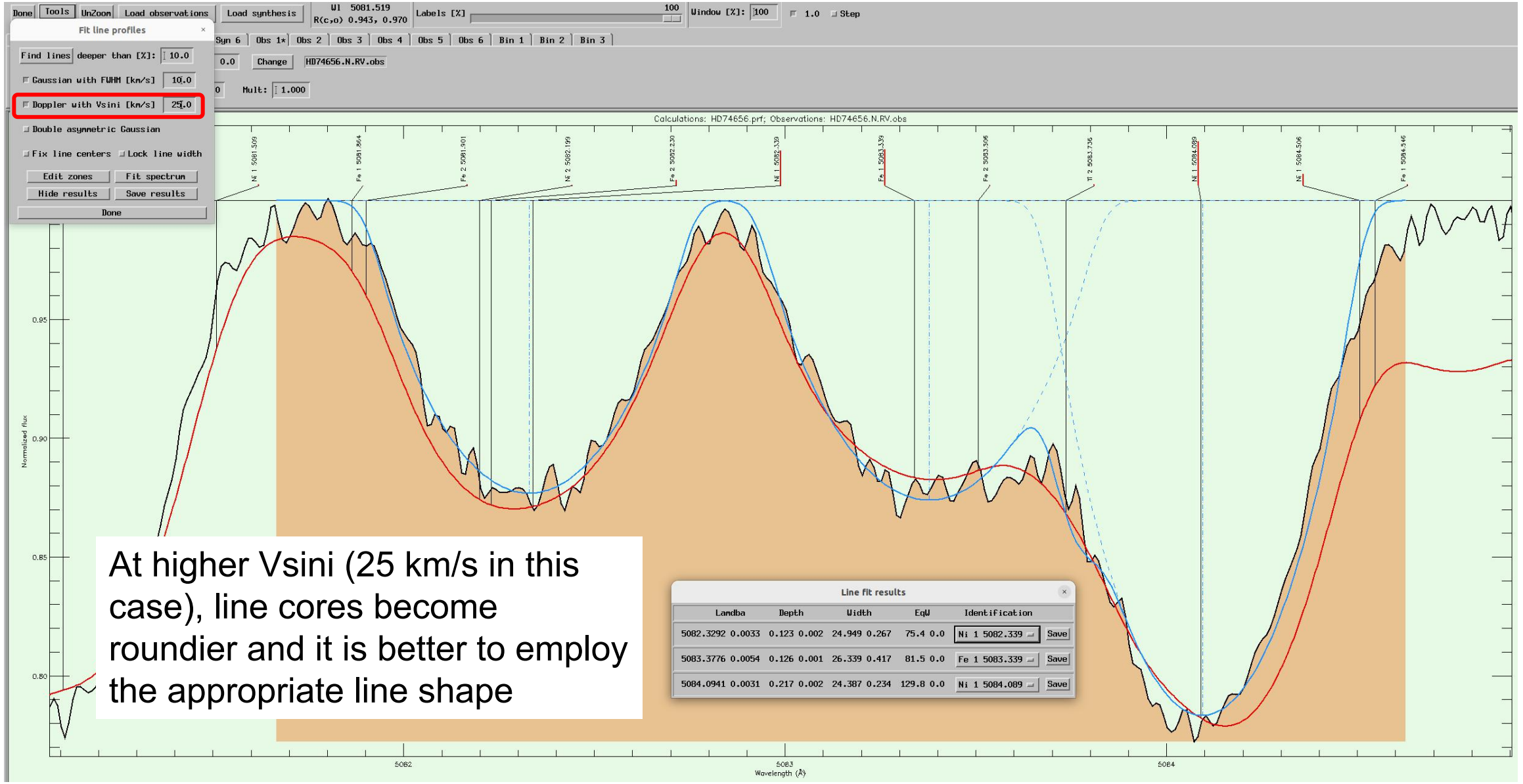
Equivalent widths: line profile fitting



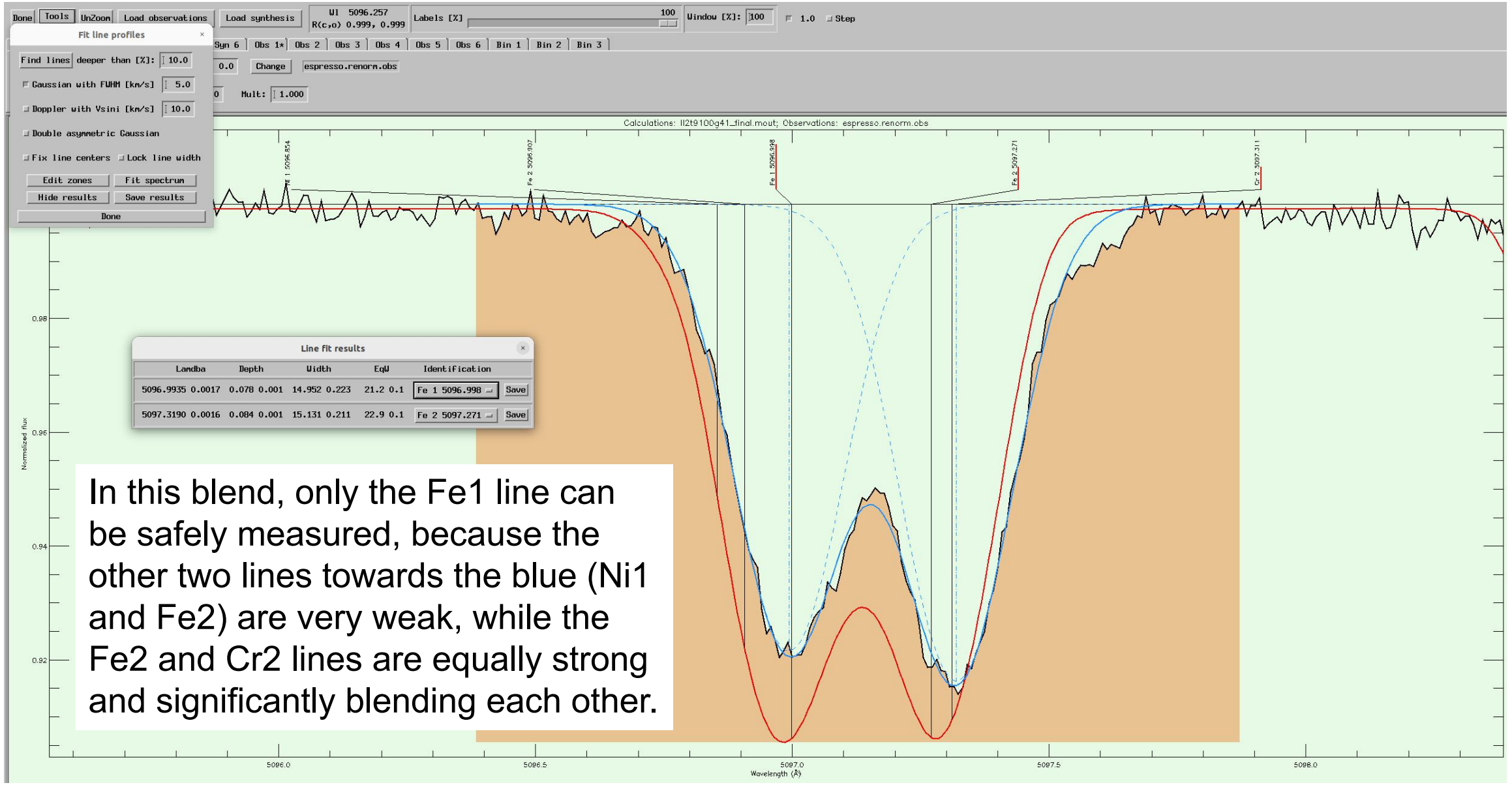
Equivalent widths: line profile fitting

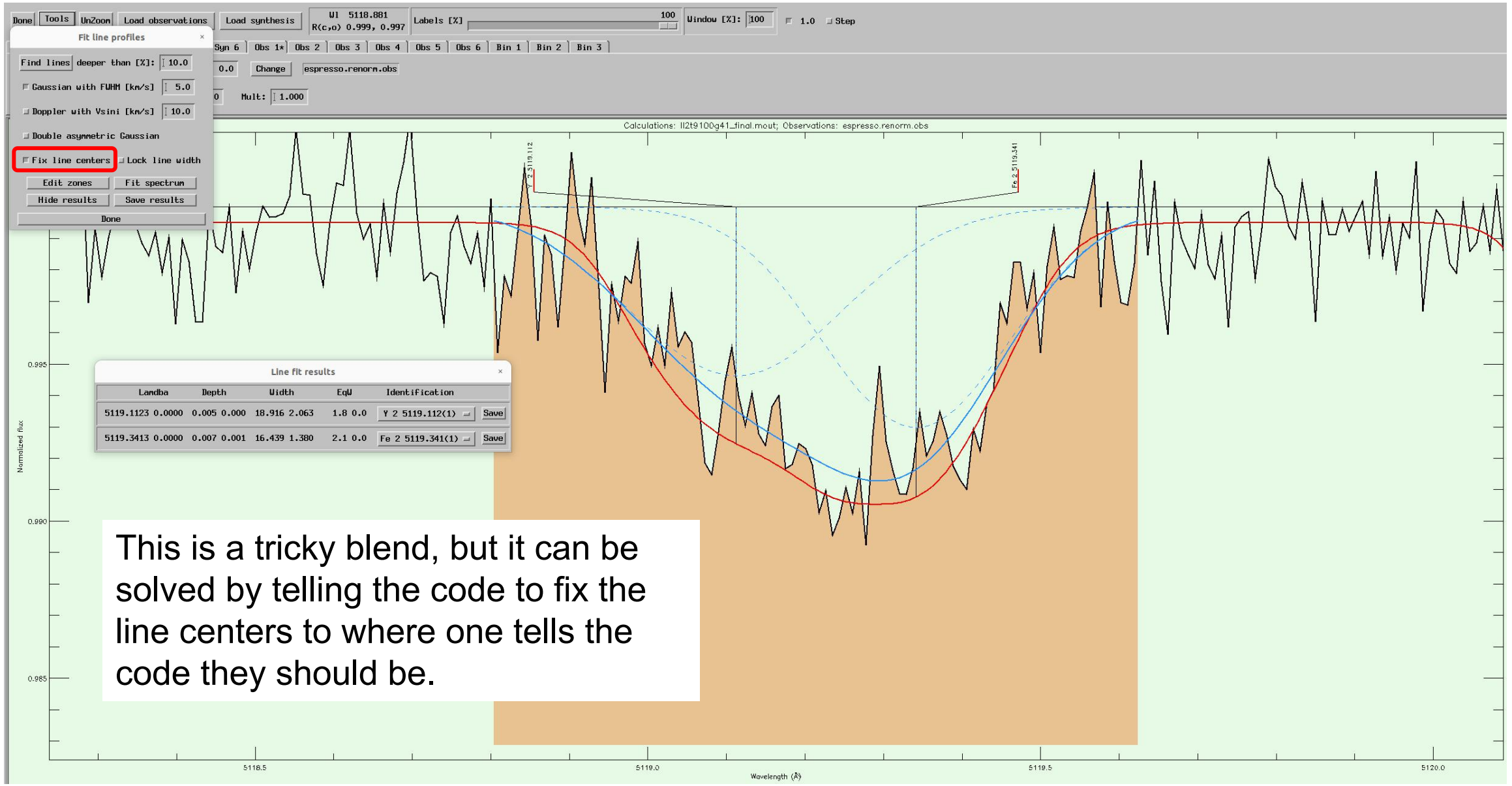


Equivalent widths: line profile fitting



Equivalent widths: line profile fitting



In this blend, only the Fe1 line can be safely measured, because the other two lines towards the blue (Ni1 and Fe2) are very weak, while the Fe2 and Cr2 lines are equally strong and significantly blending each other.

Equivalent widths: line profile fitting