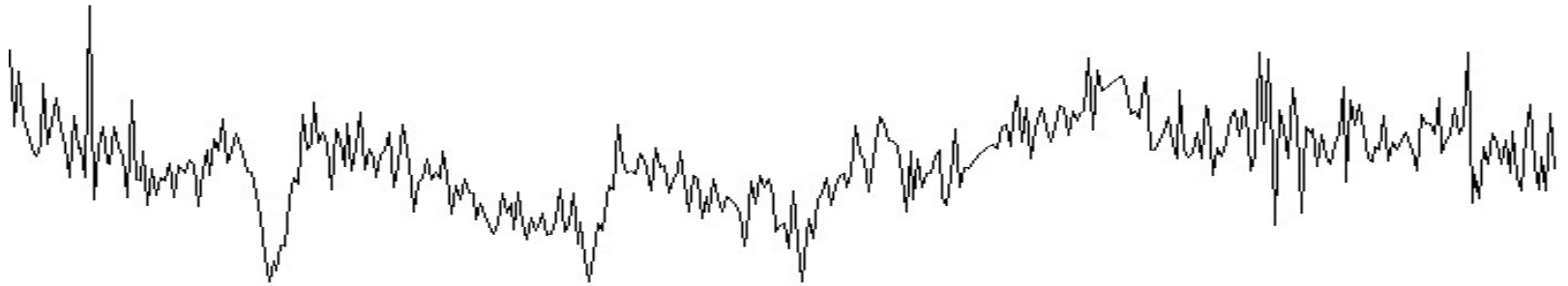


Time scale variations of CIV resonance lines in HD 24534



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- Many **Oe and Be stars** present complex and time-variable spectral line profiles in UV region
- Complex profiles can not be fitted using known classical distributions → Physical parameters of the star's regions?

**These complex profiles consist of a number of
Satellite Absorption Components -Discrete or non-Discrete-
(DACs, SACs)¹**

We study them using the **GR model (Gauss-Rotation Model)² :**

Fit complex profiles using various components
and Gauss-Rotation distribution

¹ *Bates & Halliwell 1986*, ² *Danezis et al. 2003, 2007*

- We study **CIV** resonance lines ($\lambda\lambda$ 1548.187, 1550.772 Å) in **HD 24534** (O9.5pe / B0 Ve), using spectra from **IUE** for 3 different dates
- Using the GR-model, we achieved to fit the complex CIV line profiles of the star and to retrieve the values of a group of physical parameters for every component:

- ✓ Rotational velocity, V_{rot}
- ✓ Radial velocity, V_{rad}
- ✓ Random velocity, V_{rand}
- ✓ Full Width at Half Maximum, (FWHM)
- ✓ Absorbed Energy, E_{abs}

- Spectra taken from **IUE** for 3 different dates (Fig.1) show important variation of the CIV line profiles with time.

As a result:

→ ***We expect the physical parameters of the regions that produce these line profiles to be time-variable***

- We have estimated the variations of the parameters for the 3 different dates

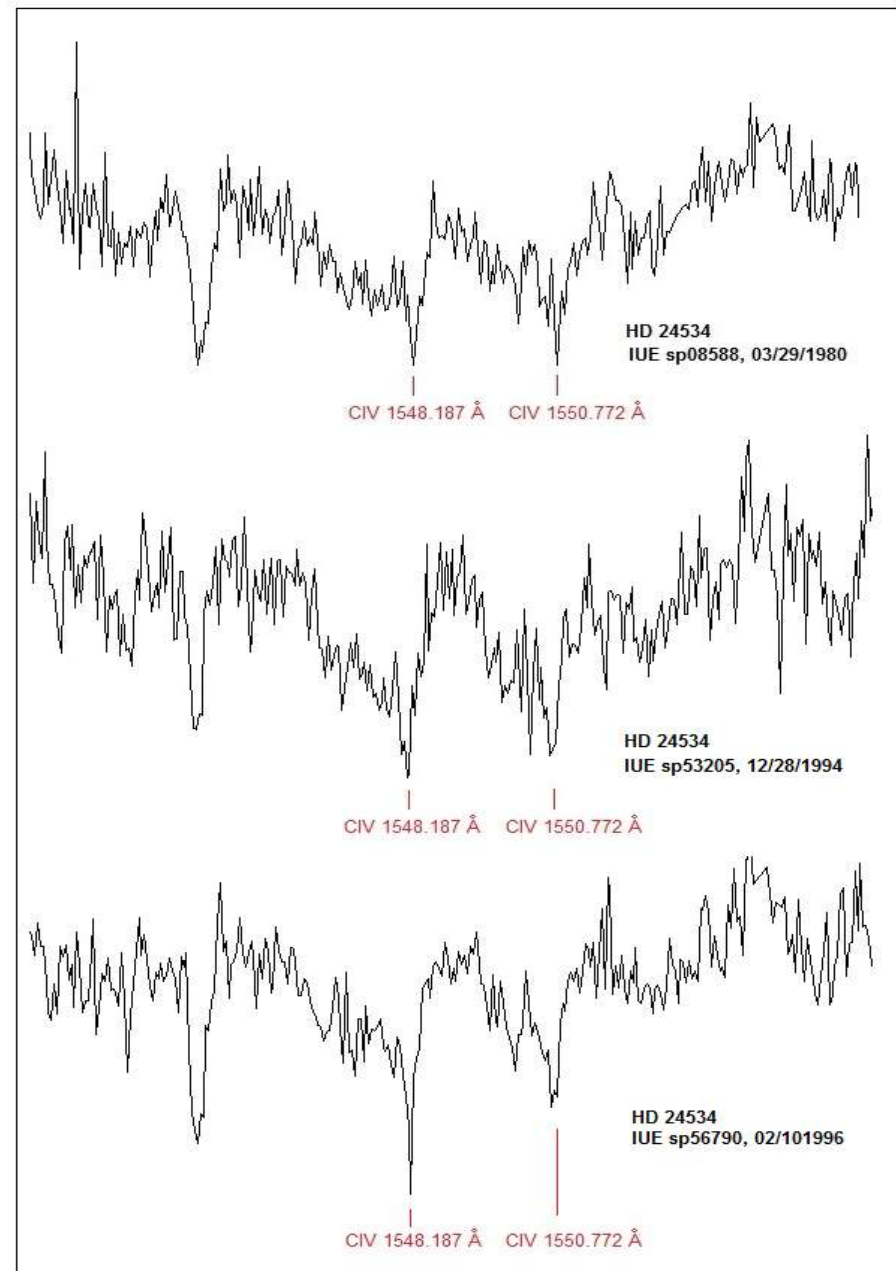


Fig1. Time scale variations of CIV resonance line profiles in HD24534

Fitting the complex profiles

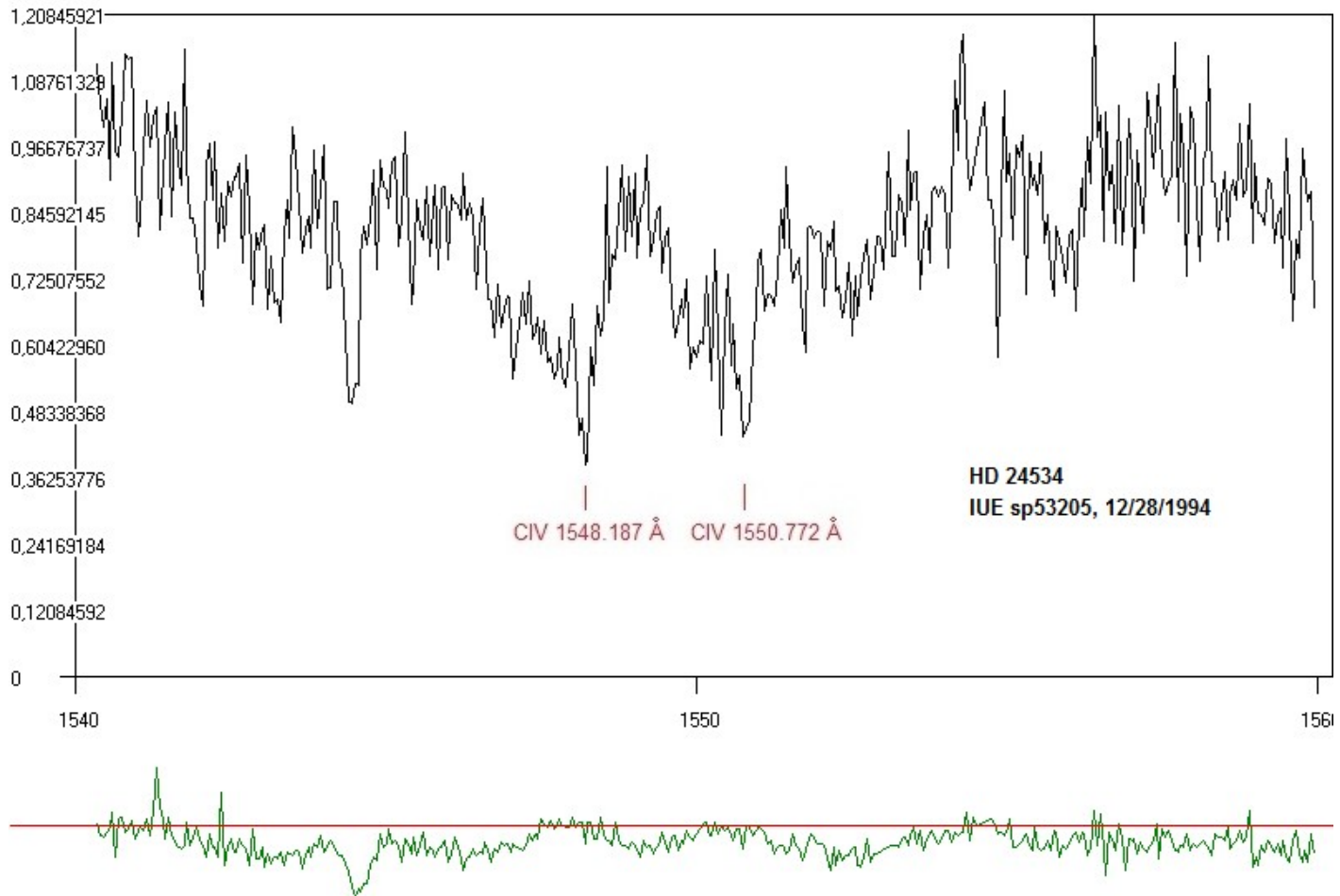


Fig2 .The complex profiles of CIV resonance lines in HD 24534, consisting of a number of Discrete and Non-Discrete (Satellite) Absorption components

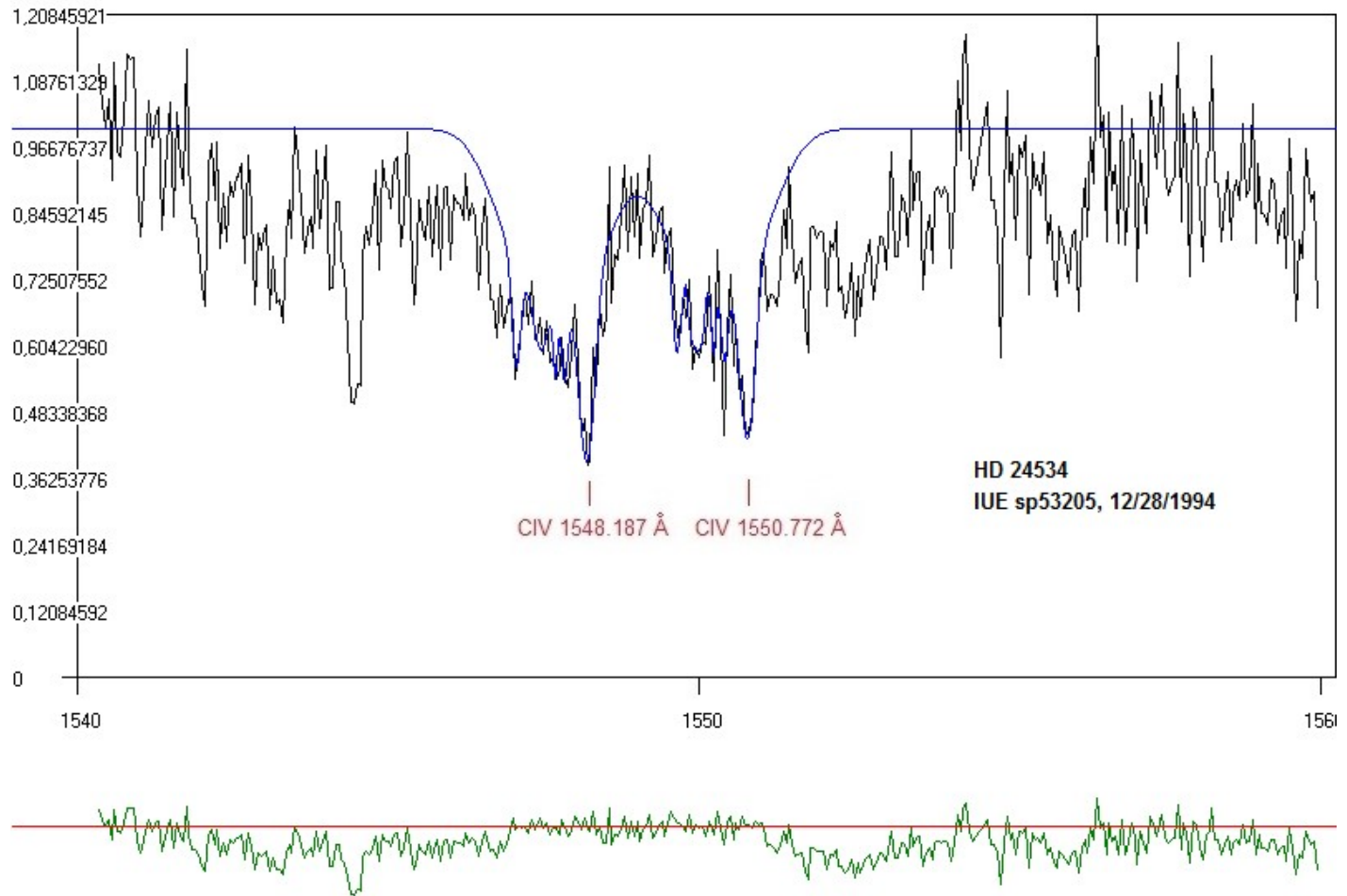


Fig3. GR-model fitting of the same CIV line profiles of HD 24534 using 5 absorption components

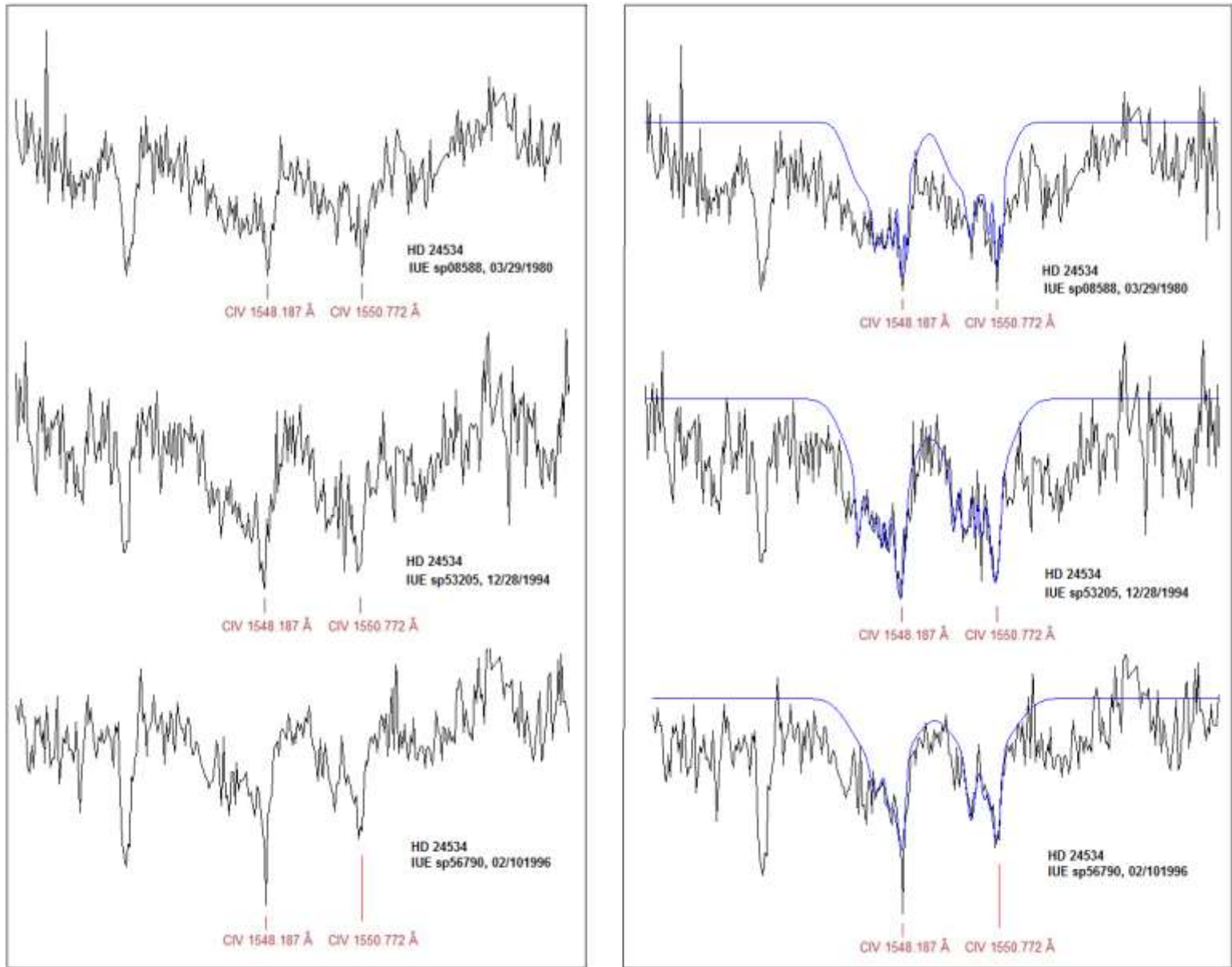
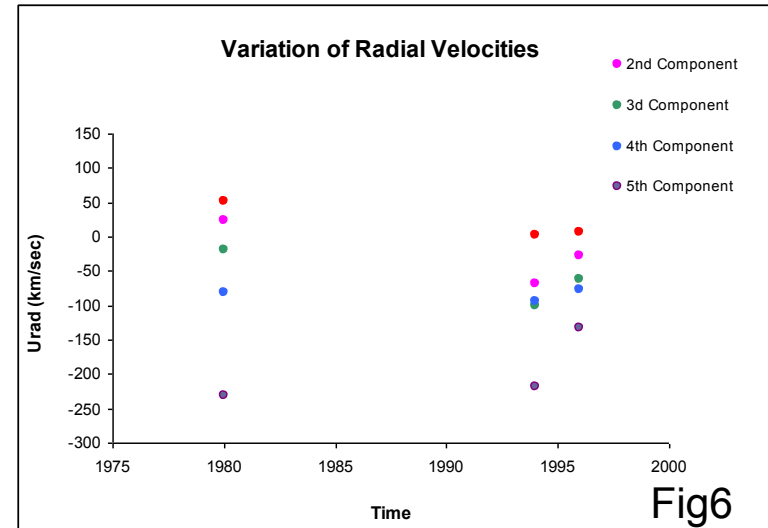
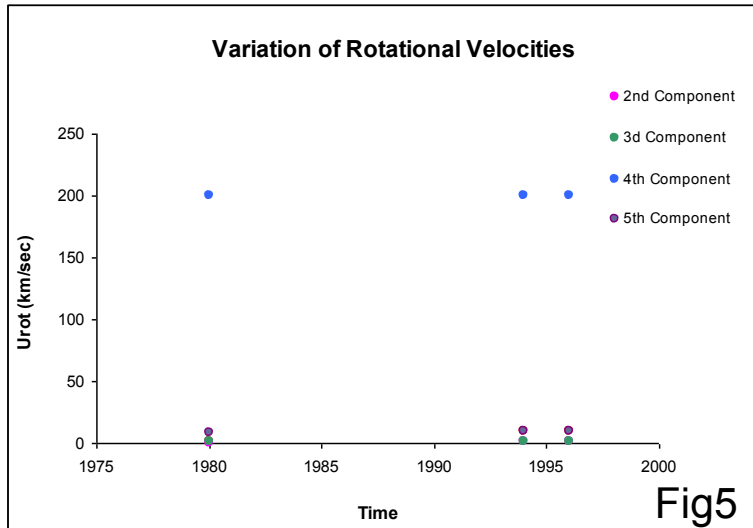


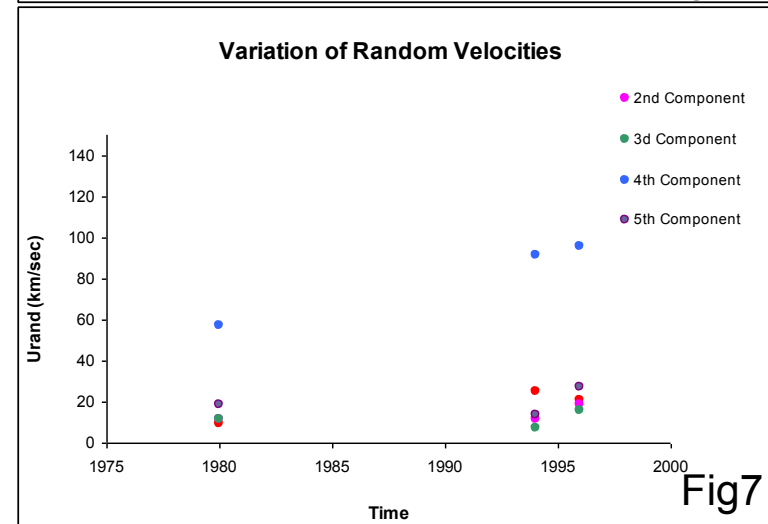
Fig4. GR-model fitting of CIV profiles for 3 different dates (1980,1994,1996)

Time-scale variations

Figures 5,6,7 show the time-scale variations of Rotational, Radial and Random velocities for every component.



- Rotational Velocities seem to remain rather constant with time for each component (Fig5)
- Radial (Fig6) and Random Velocities (Fig7) appear to be more time-variable.



Time-scale variations

Figures 8,9 show the time-scale variation of FWHM for the CIV resonance doublet (λ_1, λ_2) and for every component.

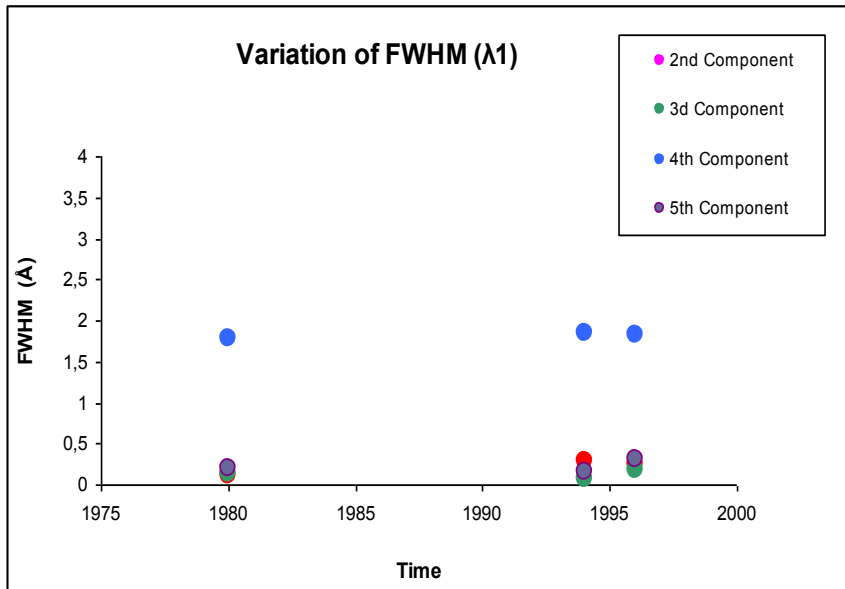


Fig8

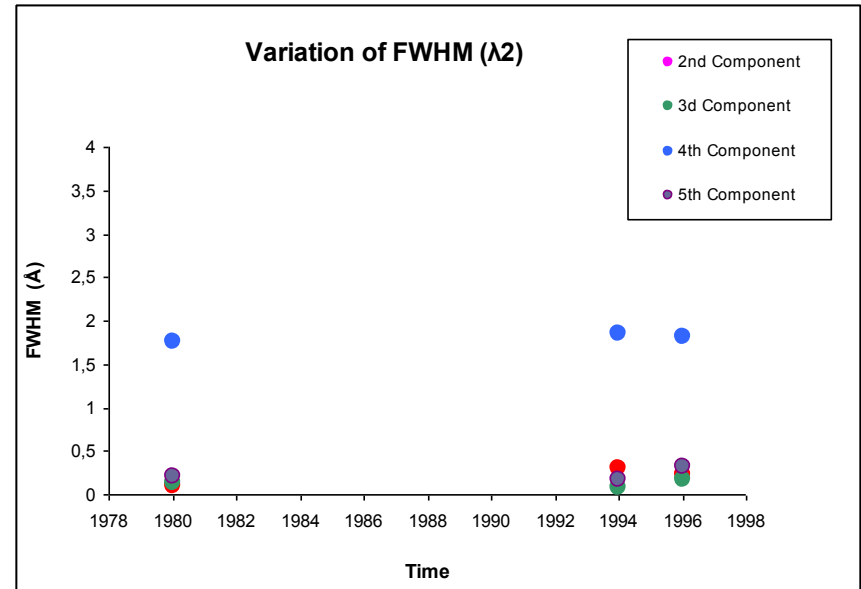


Fig9

- FWHM seems to remain rather constant with time for each component and for both CIV resonance lines.
- The behavior of FWHM over time is similar for both CIV resonance lines

Time-scale variations

Figures 10,11 show the time-scale variation of the absorbed energy E_{abs} the CIV resonance doublet ($\lambda 1, \lambda 2$) and for every component.

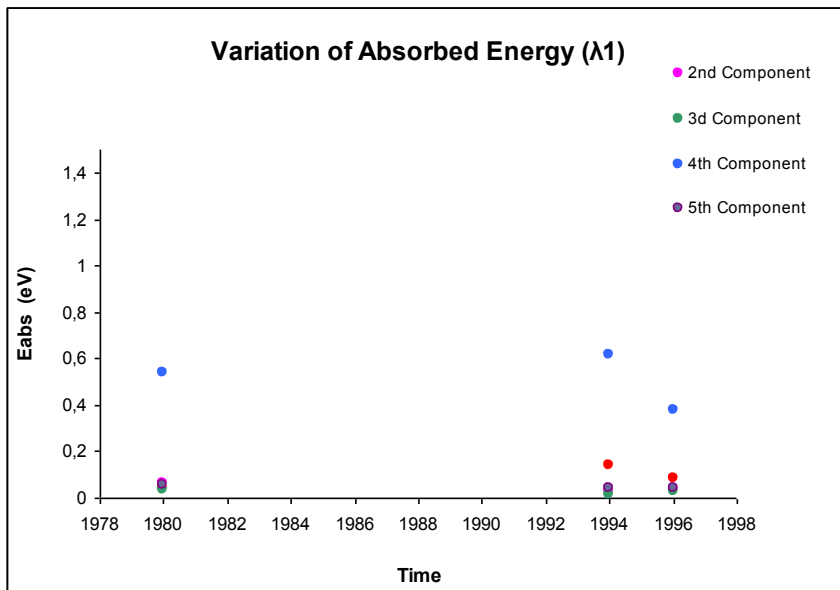


Fig10

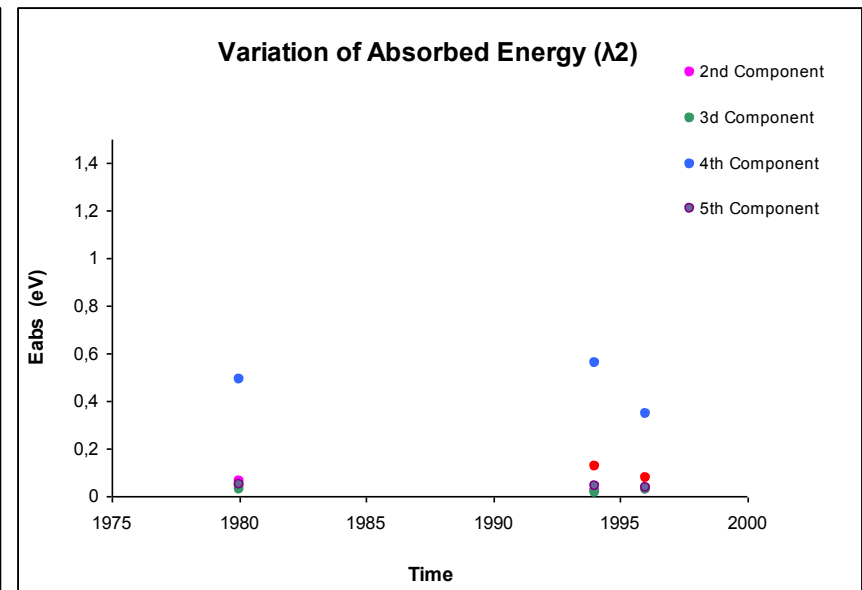


Fig11

- E_{abs} appears to have variation with time for each component
- The behavior of E_{abs} over time is similar for both CIV resonance lines, as expected, since $\xi_1/\xi_2 = 11/12 = 0.9$