RV study of planetary systems around giant stars

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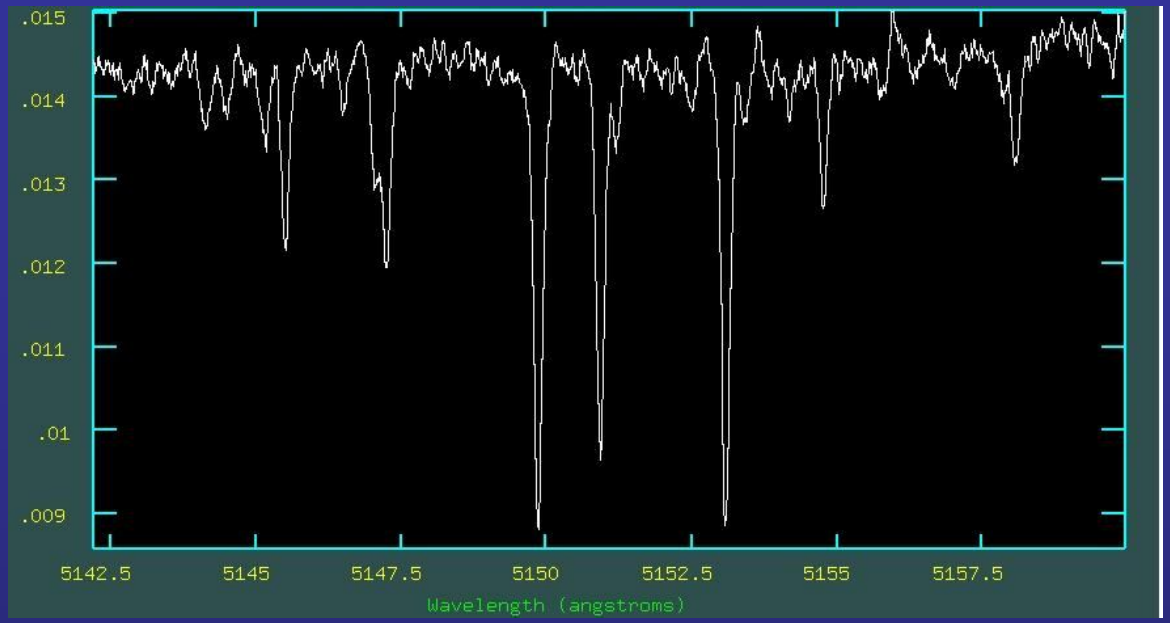
Why Giant stars?

- Cooler than their former MS progenitors and rotate slower

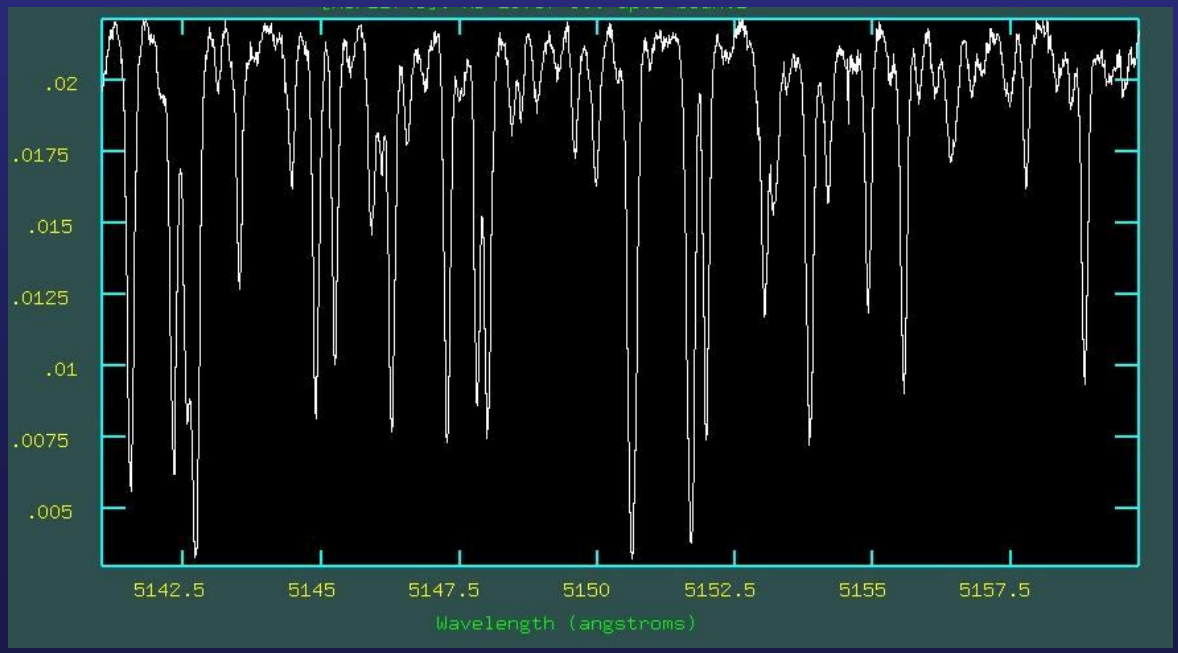
  → many narrow absorption lines…suitable for precise RVs

- Allows us to study the star-planet interaction/evolution

  → engulfment of inner planets by the host star during the RGB?



F2V (M~2.0 Msun)



K0III (M~2.0 Msun)

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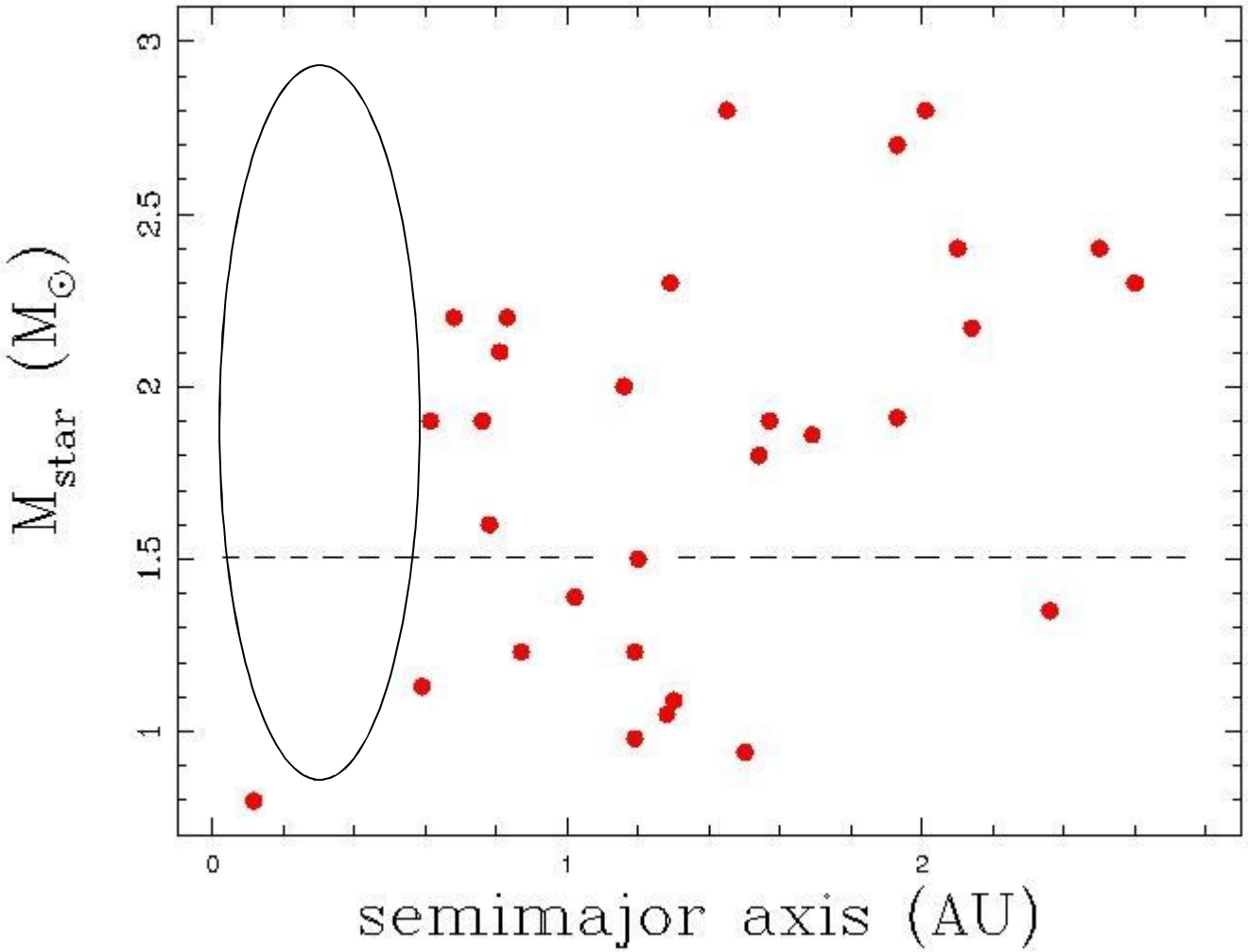
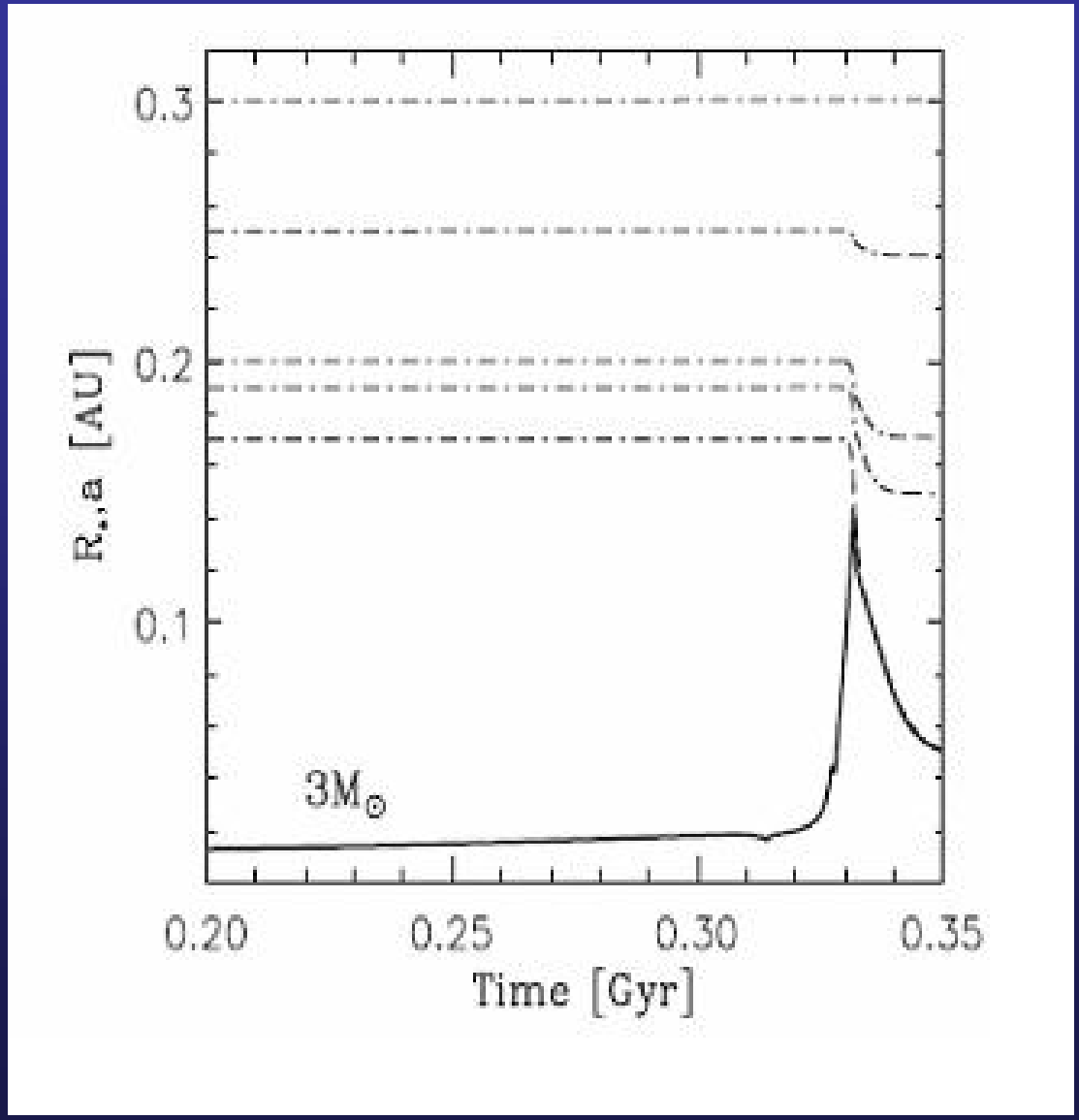




Tidal decay of the planet orbits
(Villaver & Livio, 2009)

OUR PROGRAM

- We are carrying out a RV monitoring of a sample of 164 giant stars

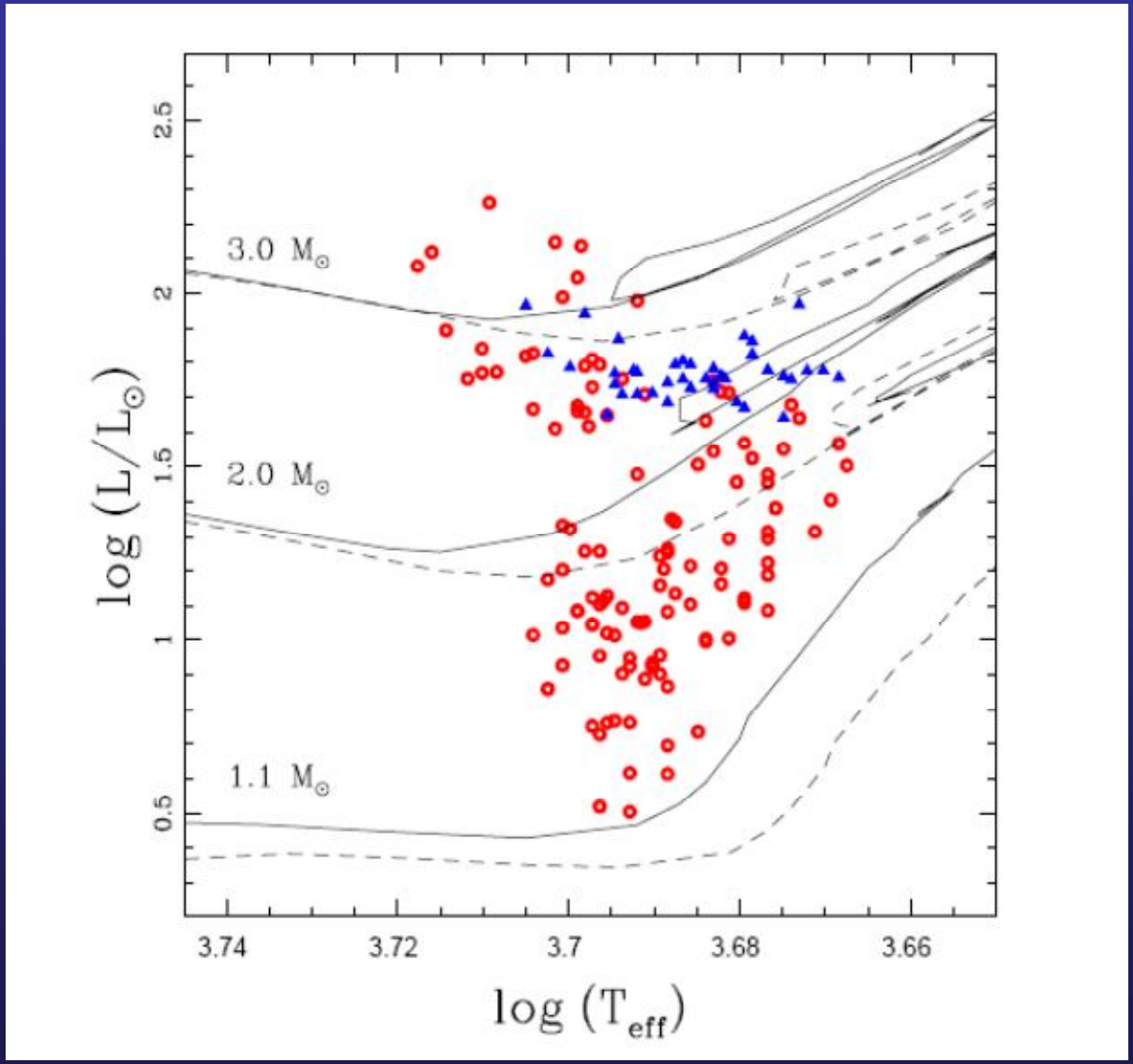
- AIMS:

  - Determine the fraction of close-in planets around RGB and HB stars

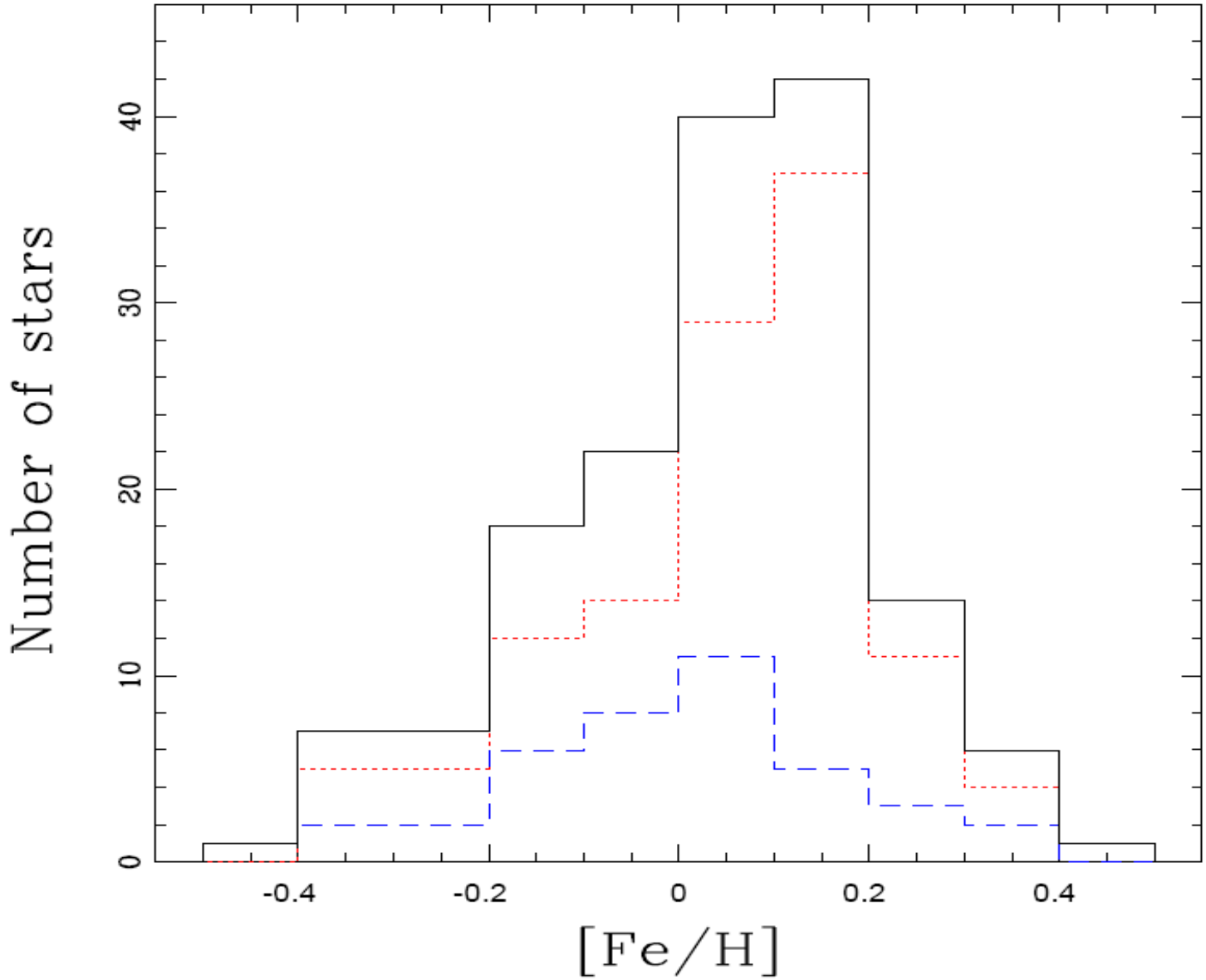
  - Compare them in order to test if there is any evolutionary effect

122 RGB stars (red circles)

42 HB stars (blue triangles)



Jones et al. 2011 (A&A 536,71)

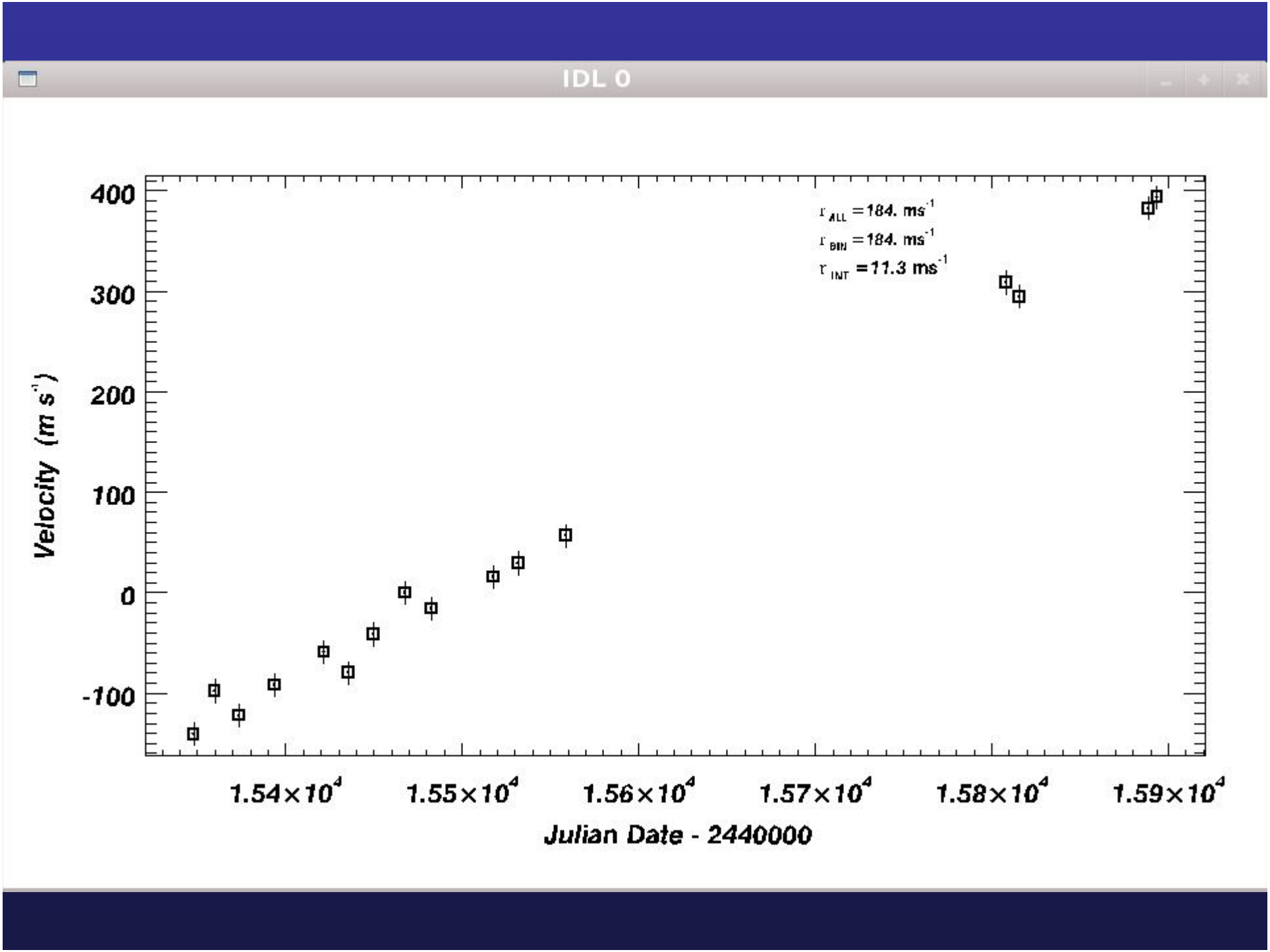


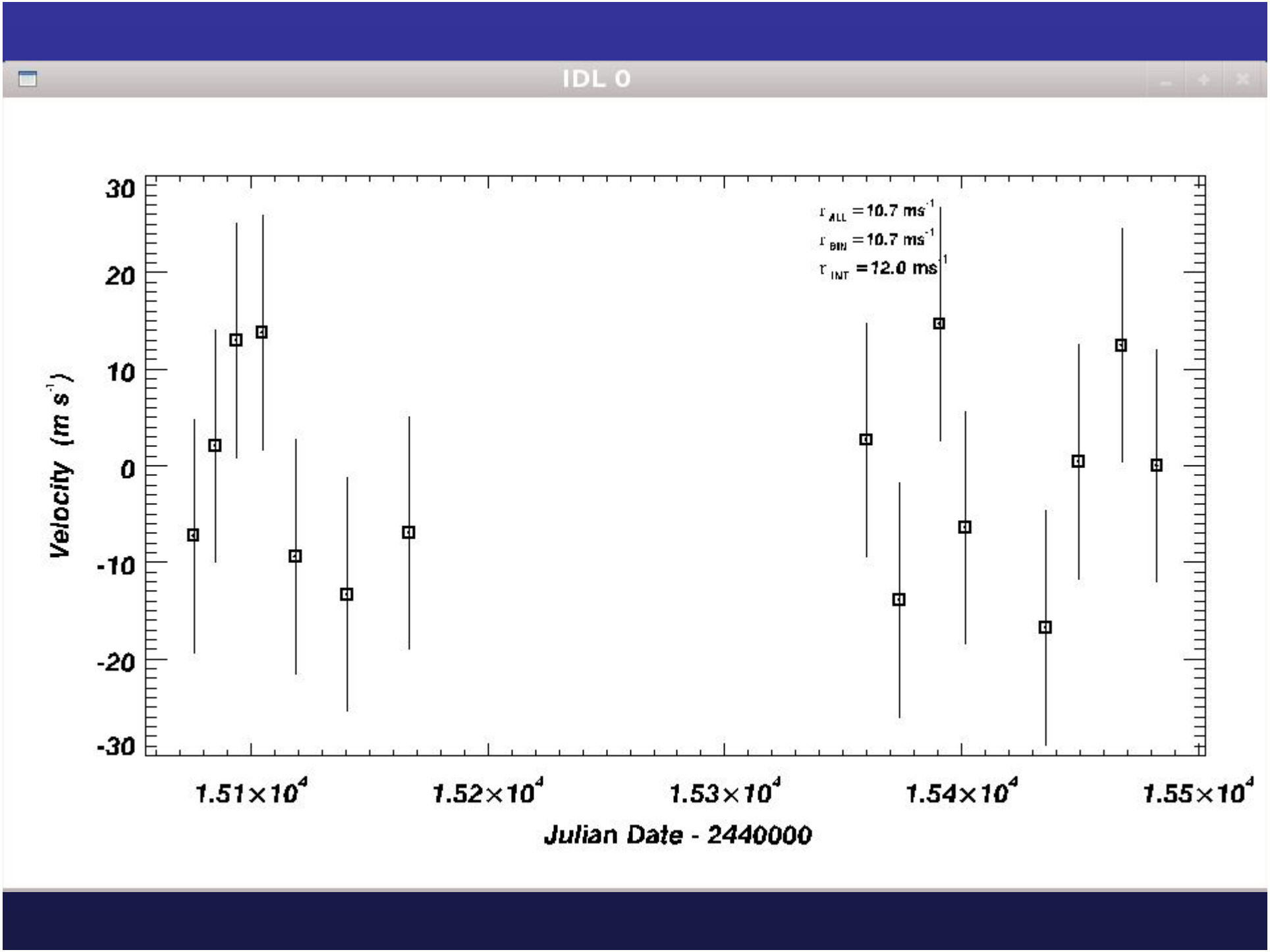
OBSERVATIONS

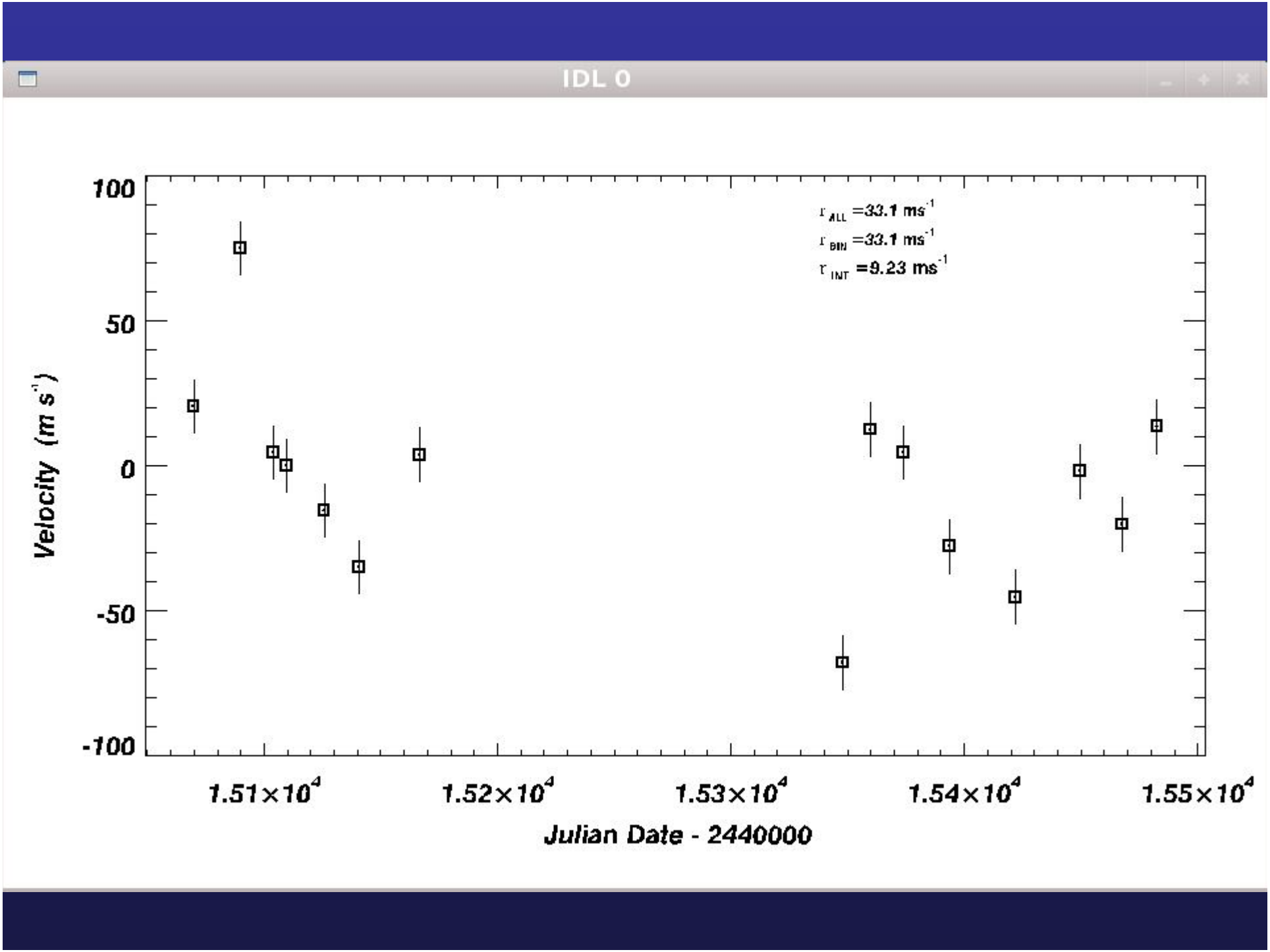
- FEROS (R ~48´000; wave ~ 3500-9000A)
  ~ 650 spectra
  RV precision ~ 10-15 m/s (simultaneos ThAr cal)

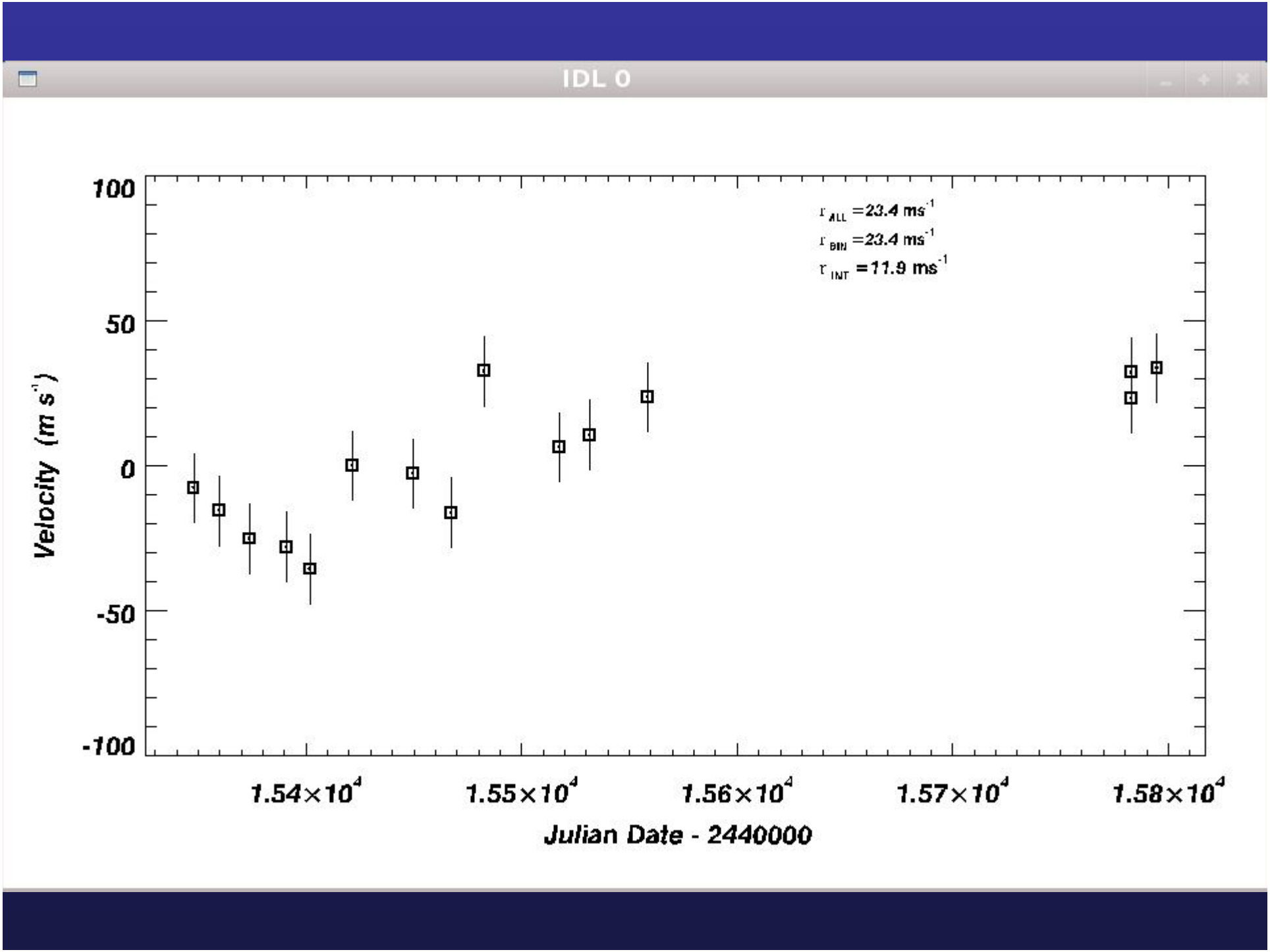
- FECH (R ~48´000; wave ~ 4100-7500A)
  ~ 900 spectra
  RV precision ~ 10 m/s (I_2 cell)

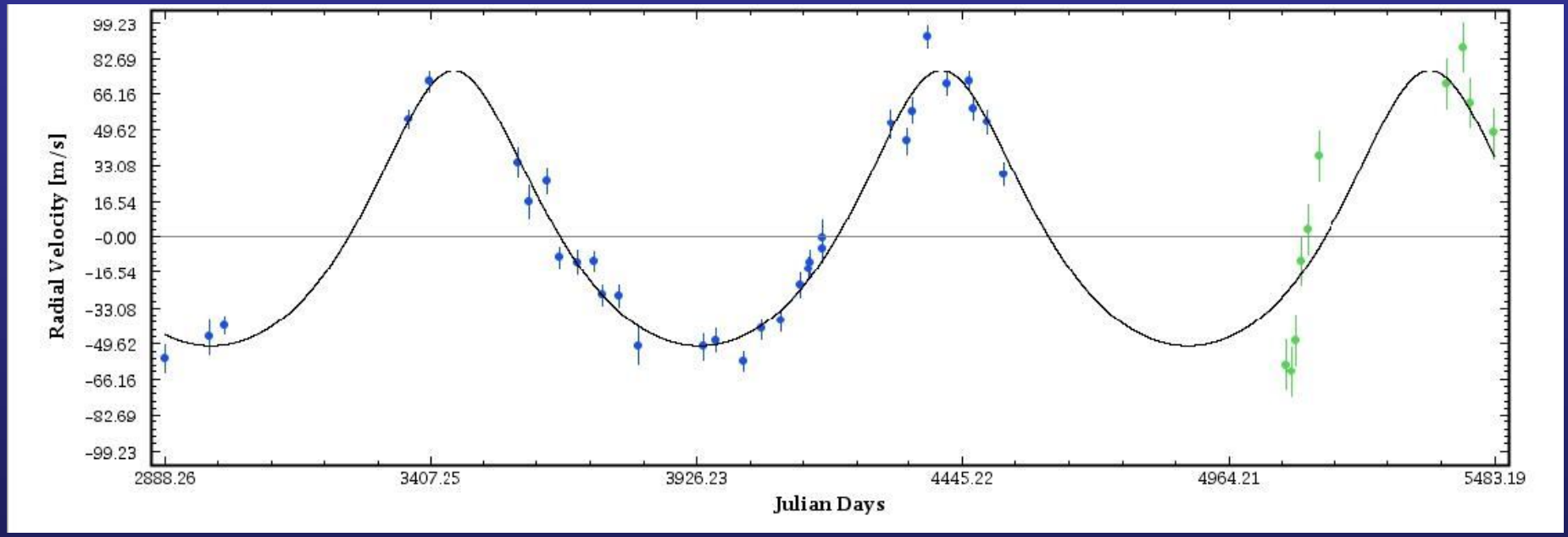
- CHIRON (R ~120´000; wave ~ 4100-7500A)
  ~ 200 spectra (ongoing project)
  RV precision 3-5 m/s (I_2 cell)











SUMMARY

- Giant stars allow us to study planetary systems around intermediate mass stars and their orbital evolution after the MS.
- We are carrying out a RV survey of 164 RGB and HB stars in order to test if the host stars engulf the inner planets during the RGB phase.
- We have discovered a binary system, confirmed a published planet a we have several candidates.
- During 2012 we will publish the first statistical results from our project comparing the RGB and HB samples.

THANKS!!!