# Lyman-$\alpha$ reconstruction results for GJ1132

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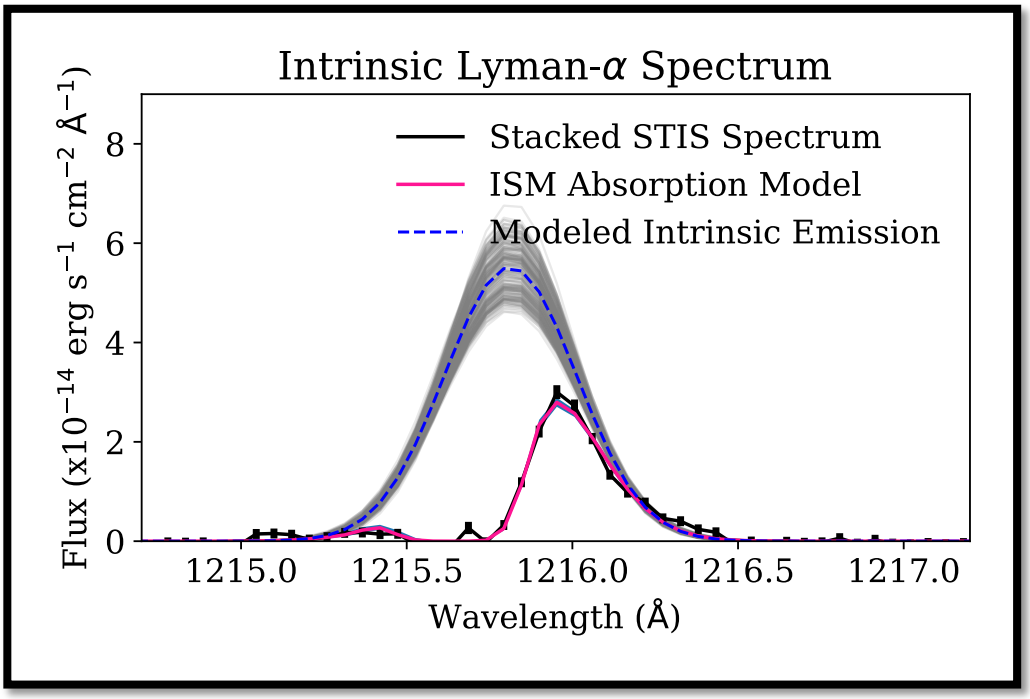


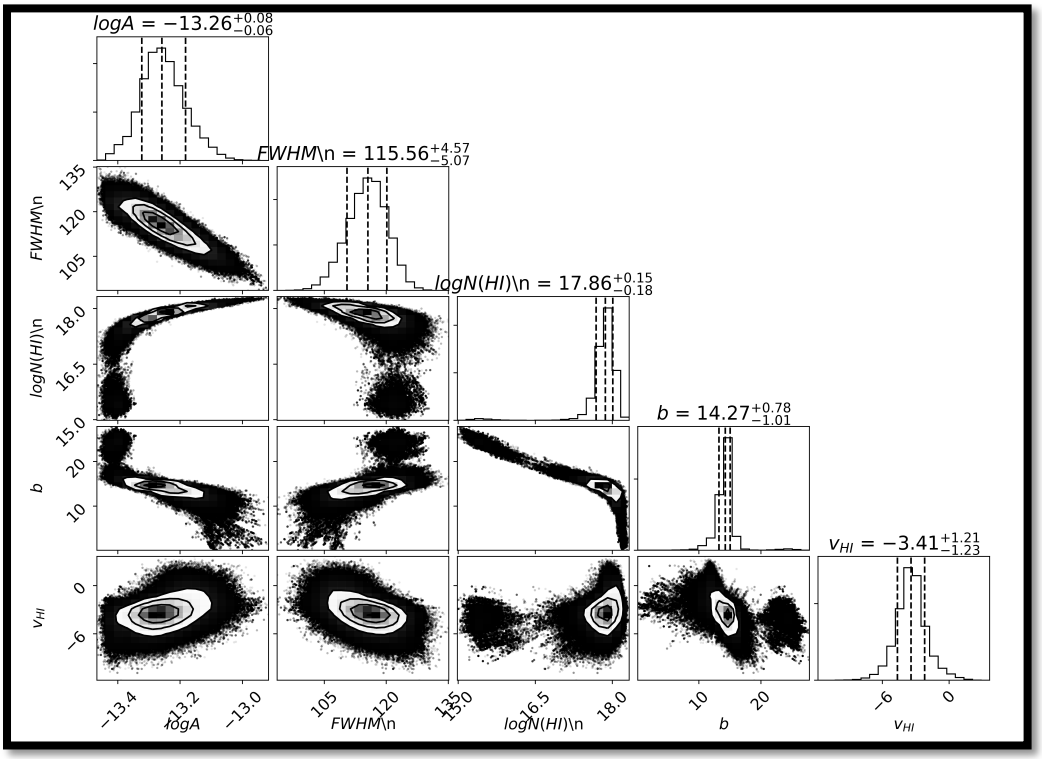

The spectrum was fit using Allison Youngblood's Lyapy fitting routine, which resulted in a single Gaussian emission line and Voigt absorption profile. The 6 parameters fitted for were:

- A, the emission amplitude
- FWHM, the full width half max of emission
- $v_s$, the source velocity
- $N_{HI}$, the line-of-sight neutral H column density
- b, the Doppler parameter
- $v_{HI}$, the line-of sight neutral H velocity

MCMC fitting of these parameters resulted in the following best-fit values with 1- $\sigma$ error bars:

| | |
|---|---|
| Line Velocity [km/s] | $35.32^{+0.95}_{-0.93}$ |
| log(Amplitude) [erg/s/cm$^2$/Å] | $-13.26^{+0.08}_{-0.06}$ |
| FWHM [km/s] | $115.44^{+4.57}_{-5.06}$ |
| log(HI Column Density) [cm$^{-2}$] | $17.86^{+0.15}_{-0.18}$ |
| Doppler Parameter (b) [km/s] | $14.2^{+0.78}_{-1.02}$ |
| HI Velocity [km/s] | $-3.41^{+1.20}_{-1.23}$ |
| log(Total Flux [erg/s/cm$^2$]) | $-13.56^{+0.06}_{-0.05}$ |

We find a Lyman-α flux of $2.76 \times 10^{-14}$ erg/s/cm$^2$ which gives f[Lyα]/f[bol] = $2.8 \times 10^{-5}$. Compared with the Sun which has f[Lyα]/f[bol] = $4.4 \times 10^{-6}$ (Linsky et al 2013).

**Priors:**

- A: uniform
- Source Velocity: Gaussian (mean = 35 km/s, width = 1 km/s)
- FWHM: uniform
- $\text{Log}_{10}(N_{HI})$: Gaussian (mean = 17, width = 1)
- b: log prior
- HI velocity: Gaussian (mean = 0 km/s, width = 2 km/s)