Stellar Circumstellar and Interstellar Physics

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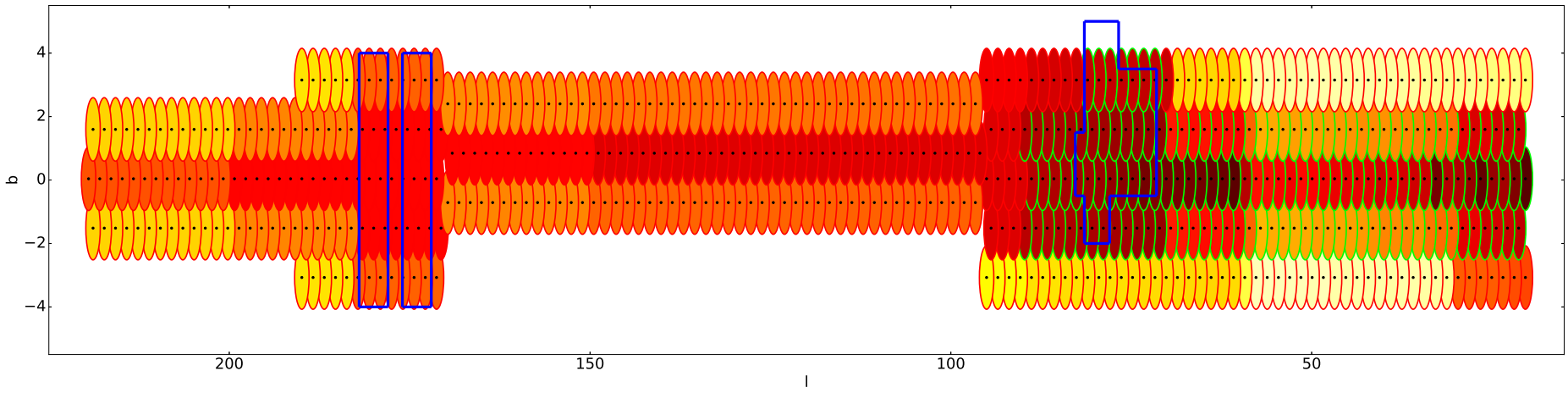


- Low Resolution program:
  - O and early-B stars
  - late-B and A stars
  - red supergiants
  - Be stars
  - diffuse ISM, PNe, SNR
  - white dwarfs / interacting binaries
  - cepheids
  - young stars / creation of the stellar field

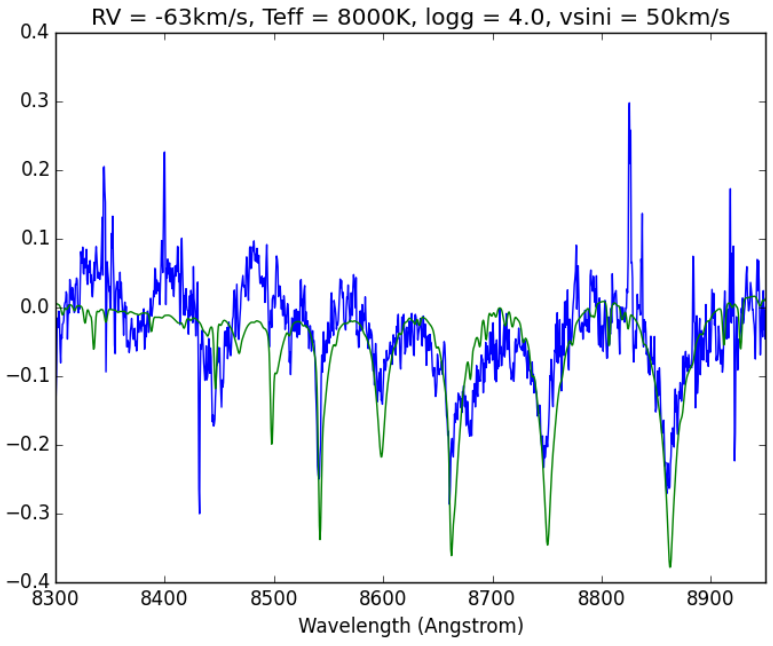
- High Resolution programs:
  - Cygnus
  - Anticentre

Work in progress:
example test for A stars

Studying the Milky Way now

Using A-stars as probes of the Milky Way structure - The sample & method

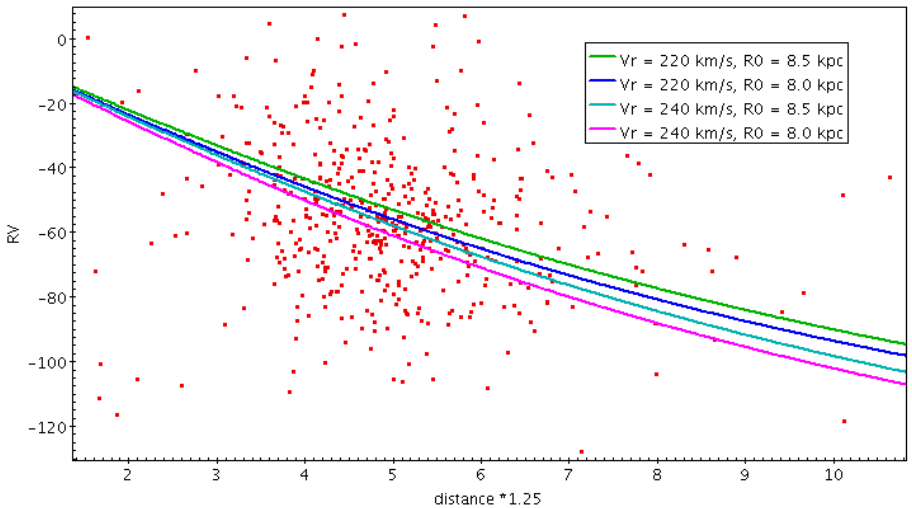
- R=4000 HectoSpec spectra of A/F stars at:
  - $l = 118°$, $b = 2°$ (473 stars)
  - $l = 178°$, $b = 1°$ (271 stars, control)
- Wavelength range: 8300-9000Å
- Cross-correlation with templates $\Rightarrow$ RV, T_{eff}, logg, vsini



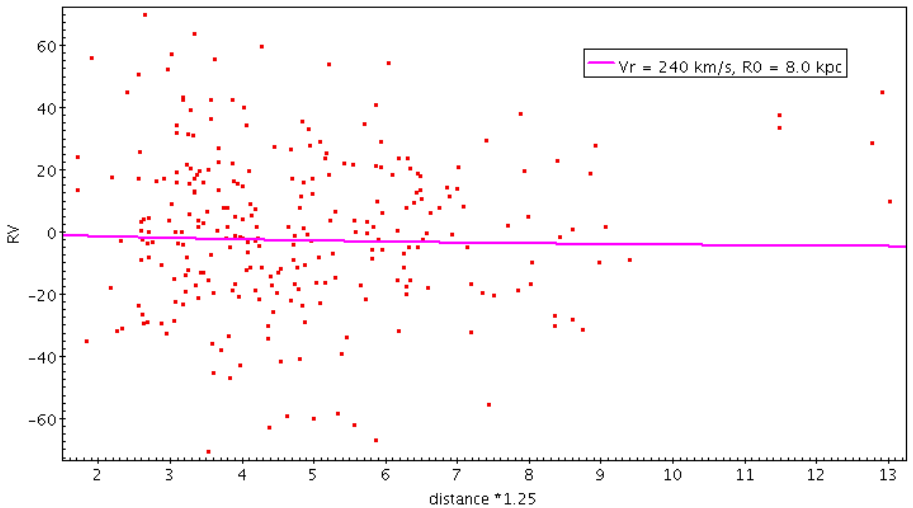
Using A-stars as probes of the Milky Way structure - Results

RV vs. distance stretched by 1.25 to account for binarity (data points) compared with Galactic rotation models (solid lines)

$l = 118°$



$l = 178°$



Stellar Type	B-V	σ (kms^{-1})	
		Dehnen & Binney (1998)	$l = 178°$
Late A	0.20	19	21
Early F	0.39	22	24
Late F	0.51	30	31

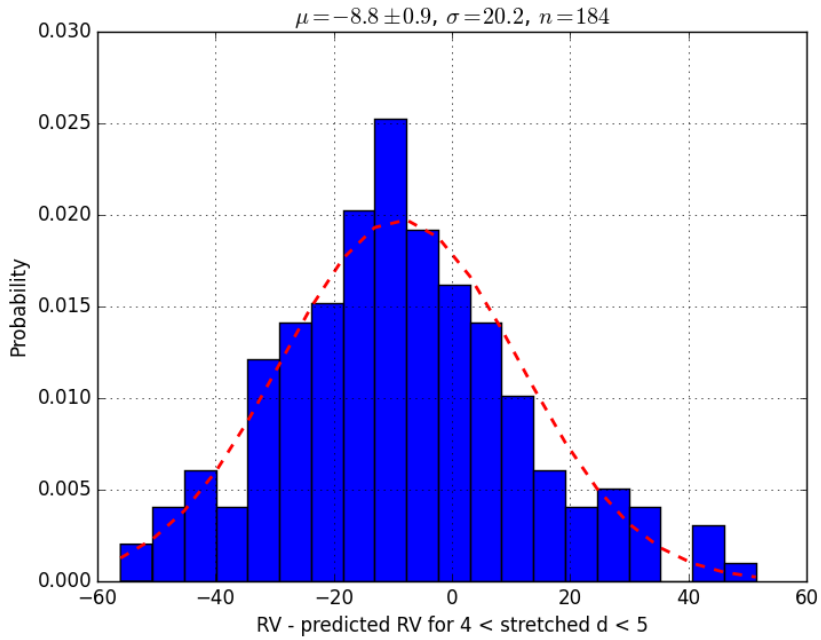
Observed scatter consistent with expected

Using A-stars as probes of the Milky Way structure - Results

- $\begin{bmatrix} \text{mean} \\ \text{predicted} \end{bmatrix} - \begin{bmatrix} \text{mean} \\ \text{observed} \end{bmatrix}$ RV =-8.8 $\pm$0.9 kms^{-1}

  for $4 < d(\text{kpc}) < 5$ with binary stretch

- Binary stretch $\Rightarrow$ outcome plausible
- A star samples work!



Better understanding to come from comparison with simulated data & Gaia astrometry