

What to expect from Radial Velocities?

Per measurement instrumental precision for FGKM dwarfs

HARPS (& HARPS-N?): ~0.8 m/s

HIRES on Keck, SOPHIE on OHP 1.93: 2-3 m/s

Stellar "noise"

Seismology: ~5mn time scale; averages out very well

Rotational modulation of spots: ~1 month time scale;

can be filtered (imperfectly)

select slow rotators/quiet stars

Stellar cycles: several years time scale

What to expect from Radial Velocities?

Pushing the envelope: Alpha Centauri Bb

460 HARPS measurements (~20 nights)

0.4 m/s photon noise, 0.7 m/s estimated systematics

(long term drift from AB orbital motion)

low/moderate activity & rotation

still 1.5 m/s rotational modulation, ~38 days period

1 Earth-mass $P=3$ days planet

0.5 m/s radial velocity semi-amplitude

some lingering doubts: filtering method affects planet significance

What to expect from Radial Velocities?

Radial velocity samples

~3000 stars (overlapping lists, only partly public)

complex mixture of flux and distance-limiting, plus some random sampling

(almost) all potential NEAT targets have *some* measurements

not all have *many* measurements

very few have 460 measurements ;-)

10 m/s amplitude: mostly complete for $P < 3-5$ years

3 m/s amplitude: 50% complete?? Can be (almost) completed

1 m/s amplitude: highly incomplete