



Contribution ID : 31

Type : **Contributed talk**

Determining Stellar Inclinations and True Planet Mass with RVs

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I aim to determine the inclination of the rotation axis of stars that host exoplanets and to use that information to find the true mass of their exoplanets. To detect exoplanets via the radial velocity method, one measures the minute redshifts and blueshifts in a star's spectrum as a star's planet causes orbital reflex motion towards and away from the observer. The strength of the radial velocity signal depends on the planet's mass and its a priori unknown orbital inclination—the rotational plane tilt relative to the observer. Without knowing the inclination, the radial velocity technique can only provide a lower limit on the planet mass—a limitation for the past 30 years. If one can find the stellar rotation axis inclination and assumes that the planet's orbital inclination is perpendicular to the stellar rotation axis, one can find the planet's true mass. My research investigates a new method of determining the stellar rotation axis from RV observations by analyzing and modeling the changes in both stellar radial velocity and surface temperature shifts as a function of time. I use data from the NIR spectrographs NIRPS and SPIRou and reduce it via the line-by-line technique (LBL) to measure both the stellar RV and temperature variations (dTemp), modeling the outputs with starry and fitting the stellar rotation axis inclination with MCMC sampling, from which a true planet mass can be found.

Did you give a contributed talk at CASCA 2026?

No

If you are selected for a poster, would you be interested in giving a short flash talk on your work?

Yes

What is your career level?

MSc

Which keyword describes the area of focus of this talk?

Exoplanets

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Session Classification : Exoplanets & Stars