Identifying Extra Solar Planets and their Key Features using the Doppler Wobble and Planetary Transits Methods

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Abstract

This is the abstract

Introduction and Background

Aims

Understand the effect of Doppler shifts on the intensity of stellar spectra and use the Python scipy.optimize library to determine "best-fit" radial velocities from high- resolution spectra observed at different epochs Derive a radial velocity curve i.e. radial velocity as a function of orbital phase for each star, and use fitting to estimate the amplitude of each curve Estimate the mass and semi-major axis of each planet.[1]

Method

For the Doppler Wobble method it was first necessary to import all the data provided into a directory that could be accessed by the code source files. From here it was possible to start writing the Python script that would take the data and produce the required outputs as outlined in the aims above.

Results

For doppler wobble method 1.1 result is graph.

1.2 radial velocity of both stars on all dates

1.3 plot radial velocity as a function of time, calculate the phase of each star and plot the radial velocity as a function of phase

1.4 calculate values of v_{mean} v_s and ϕ_{max} and determine errors, for both stars

1.5 calculate the mass of each planet and the semi-major axis of each planet with errors

Analysis

Discussion

Conclusion

References

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Aims

Obtain a phase-folded photometric light curve for a star with a transiting planetary companion. Use this to estimate the radius and orbital semi-major axis of the planet Apply the method of least-squares to estimate mean apparent magnitudes during the transit and non-transit phase. Hence estimate the radius of the planet.[1]

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