Polarimetric Detection of Earth-like Exoplanets

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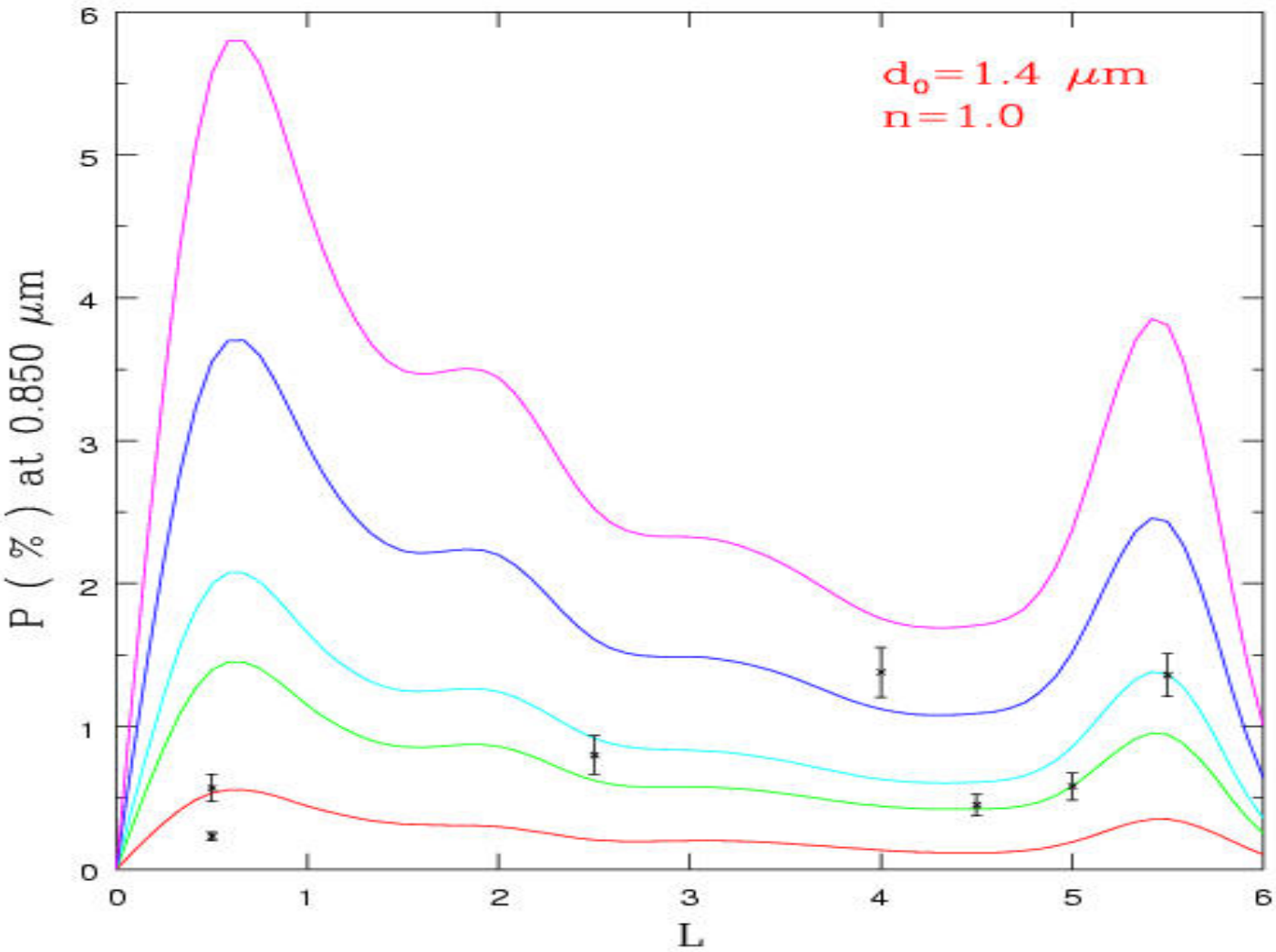
Introduction



Exoplanet Detection Methods

Statistics

185 planets

18 multiple planet system

(1) Doppler Method

Limitations : V > 5 m/s

(2) Transit Method

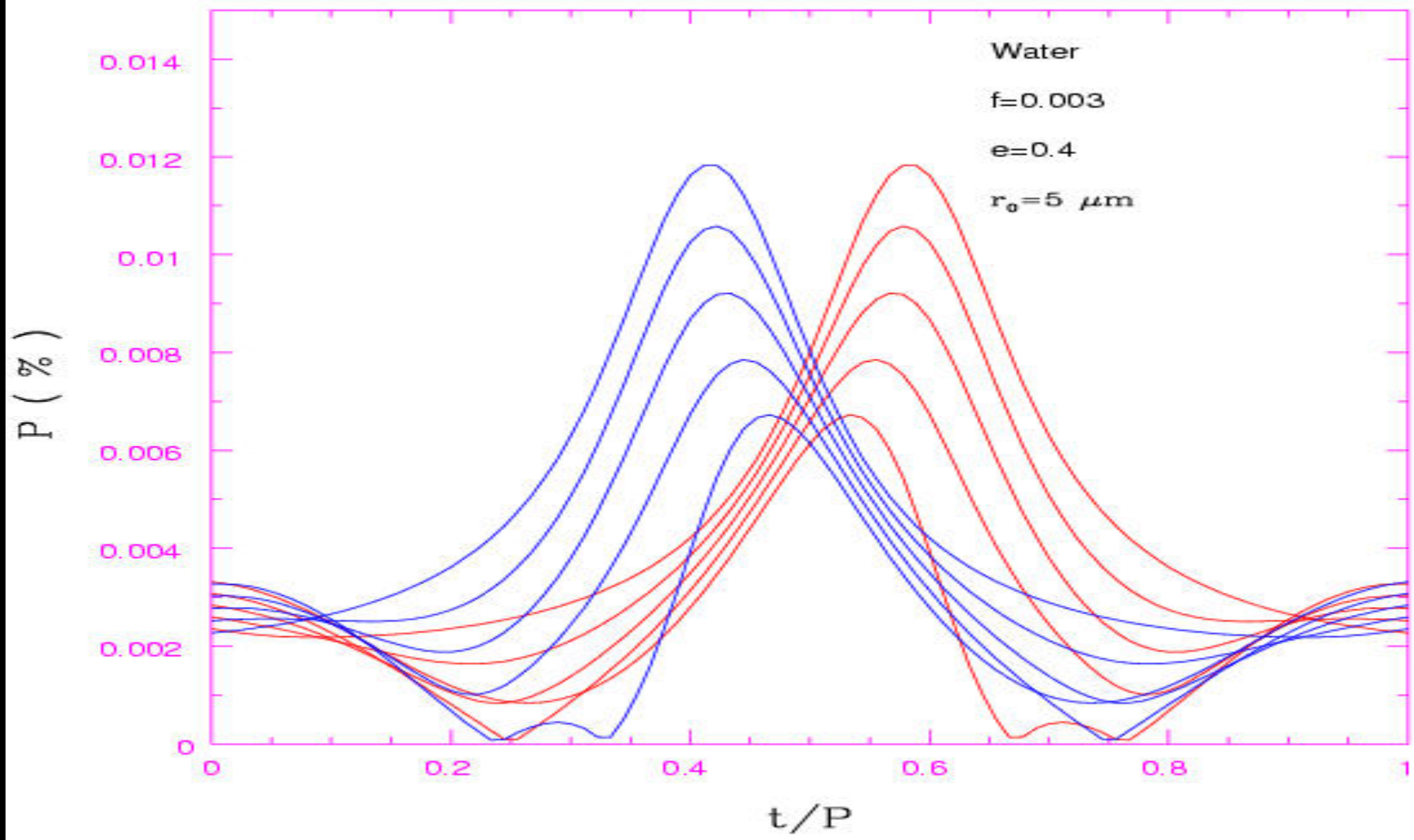
Limitation : High inclination angle, large size, closed to the star

(3) Gravitational Micro-lensing

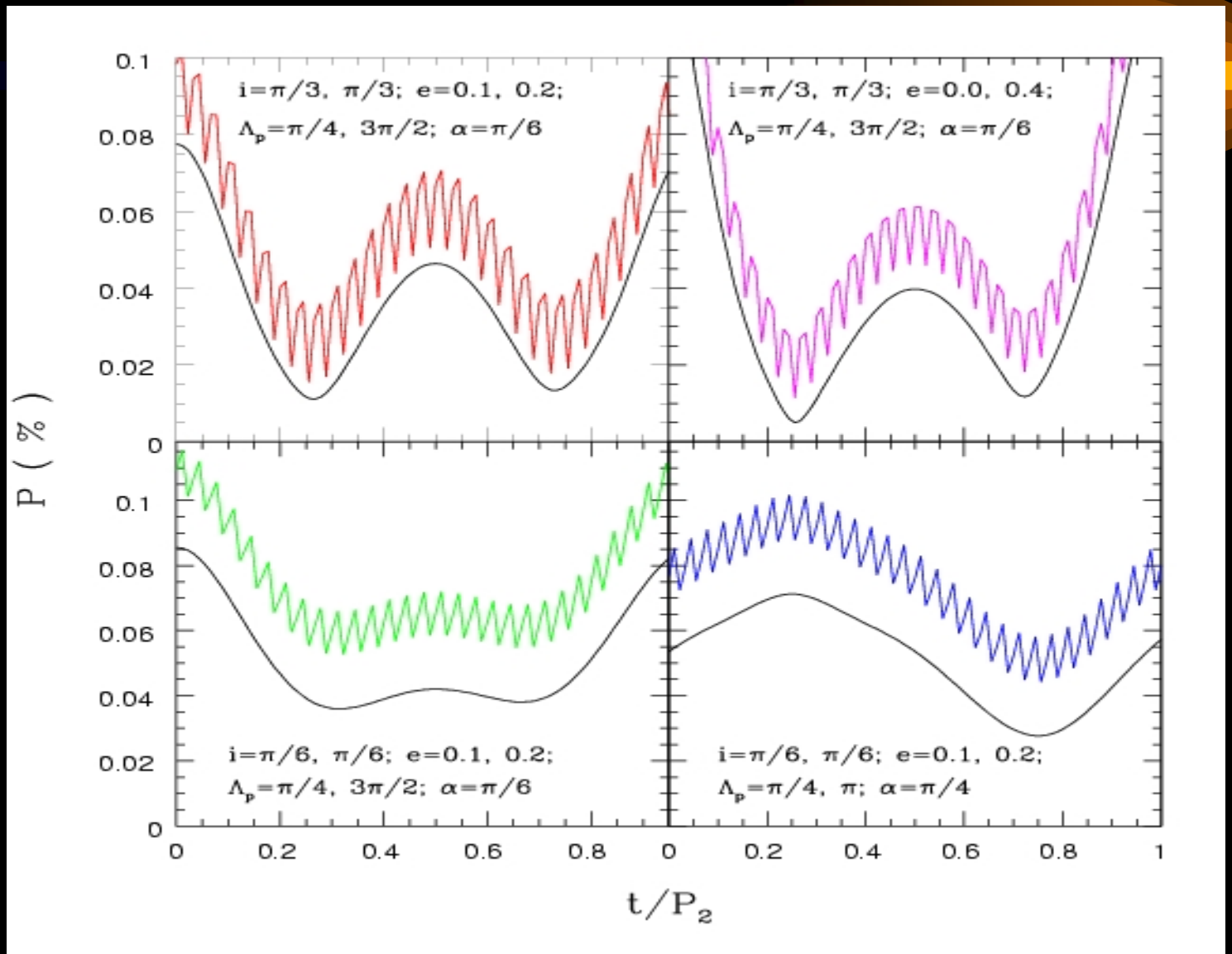
Limitation : Chance method

New Method of Detection

Polarization of Starlight by Exoplanets



Polarization profile by a system of two planets



Conclusions

(1) Polarimetric method can be much better method in detecting and probing extra-solar planets.

(2) Instrument should be sufficiently sensitive to detect linear polarization of 10^{-3} to 10^{-5} .

(3) Systematic time variation in polarization will confirm the presence of earth-like planets around main sequence stars.

(4) PLANETPOL at WHT and Polarization nulling interferometer on board NASA's EPF plan to do polarimetric detection of exoplanets.

THANK YOU !!