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Numerical results of the Global Polytropic Model for the orbits of 15 planetary systems

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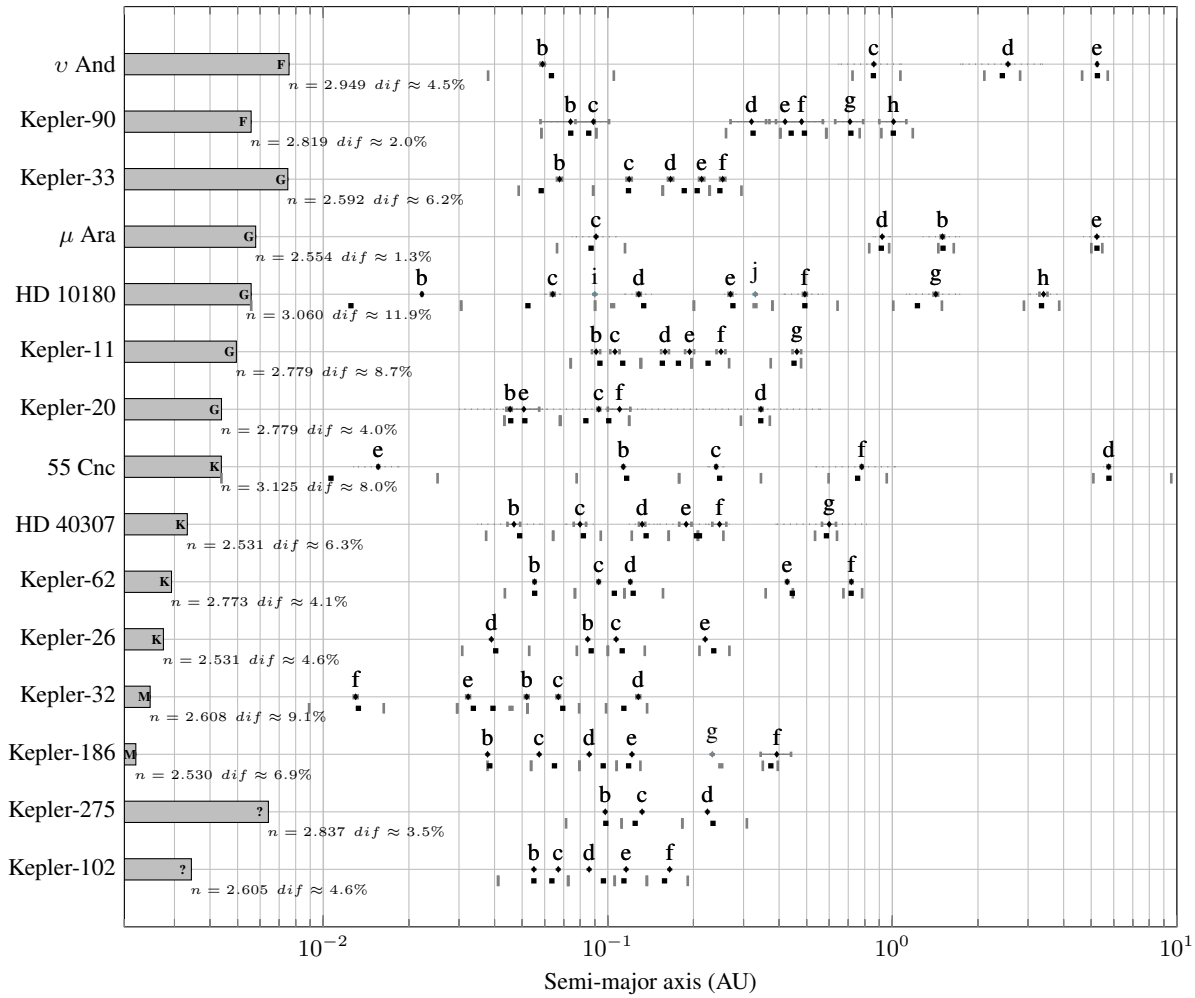
Abstract: In the framework of the Global Polytropic Model, we assume hydrostatic equilibrium for a planetary system, and solve the resulting Lane-Emden differential equation in the complex plane. We thus obtain polytropic spherical shells defined by successive roots of the Lane-Emden function θ. These shells provide hosting orbits for the planets of the systems under consideration. In the present poster, we present the results within this framework, for 15 stars hosting planetary systems: 55 Cnc, μ Ara, υ And, HD 40307, HD 10180, Kepler-11, Kepler-20, Kepler-26, Kepler-32, Kepler-33, Kepler-62, Kepler-90, Kepler-102, Kepler-186, Kepler-275.



- Bars represent the radii of the host stars. At the end of the bar we display the spectral type of the star; the calculated polytropic index n; the average error for the orbit radii dif computed by the Global Polytropic Model.
- Black diamonds represent the semi-major of the planets.
- Gray error bars represent the respective measurement errors.
- Gray dotted lines represent the maximum values for periastron and aphiastron, as calculated from the measured eccentricity.
- Gray diamonds represent additional planets, not yet verified.
- Gray vertical lines represent the limits of the corresponding polytropic cell.
- Black squares represent the computed semi-major axis of the planets.
- Gray squares represent the computed semi-major axis of the unverified planets. It also marks an alternative computed semi-major axis for Kepler-32 b, supposing that there is a third undiscovered planet in that polytropic cell.

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