Contribution ID: **136** Type: **not specified**

HD 110067 Resonant Chain: Evidence for Quiescent Formation from Multi-Planet Spin-Orbit Measurements

Monday 7 July 2025 10:00 (15 minutes)

Multiplanetary systems in resonance offer a unique insights into planet formation and evolution. While resonant configurations, particularly among sub-Neptunes, probe dynamical and atmospheric interplay, their origins and survival rates remain debated. Theoretical models suggest primordial misalignment could disrupt resonance during formation; consequently, surviving resonant systems are predicted to exhibit lower spin-orbit angles compared to their non-resonant counterparts, indicative of less disruptive histories. The Rossiter-McLaughlin effect allows us to determine the spin-orbit angle as this parameter is indicative of formation and evolutionary pathways of exoplanetary systems. In this talk, I will show multi-facility observations of HD 110067, resonant chain of six sub-Neptunes orbiting a star in a triple system. The orbits of the second innermost planet HD 110067c as well as the outer planet HD 110067g are well aligned. This is the first time the spin-orbit angles of more than a single planet have been measured for a pristine resonant chain. This result is indicative that the current architecture of the system has been reached through convergent migration without any major disruptive events. The RM effect also aids in constraining TTVs of these small planets unraveling why resonant systems display overall lower densities compared to non-resonant ones.

Presenter: ZAK, Jiri (Astronomical Institute of Czech Academy of Sciences)

Session Classification: RV-detected multiple systems