Detection and Dynamics of Exoplanets (DDE): Interplay between theory and observations



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Astrometric jitter due to magnetic activity for Sun-like stars

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Astrometric detections of exoplanets by missions like Gaia and JASMINE rely on measuring minute changes in the positions of stars - known as astrometric jitter - arising from the gravitational pull of the planetary companions. Another source of astrometric jitter is stellar magnetic activity which can interfere with the detection and characterization of Earth-mass planets through astrometric measurements. In this context, we examine the conditions under which the magnetic activity-induced jitter becomes comparable to the planet-induced jitter. Specifically, we investigate the dependence of magnetic jitter on inclination of the stellar rotation axis, stellar metallicity, configuration of magnetic features, and stellar rotation rate. We show that, for stars with solar-like magnetic activity, the jitter due to activity becomes comparable to that produced by an Earth-mass planet at 1 AU. We also find that for certain configurations of magnetic features, activity-induced jitter reaches levels detectable by Gaia.

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