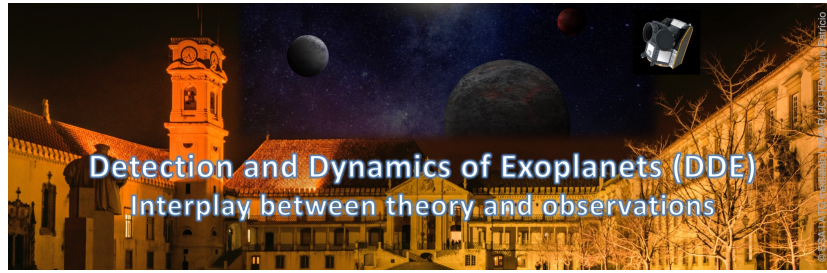


## Detection and Dynamics of Exoplanets (DDE): Interplay between theory and observations



Contribution ID: 123

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### The search for exoplanets using Gaia-DR3's RUWE and Hipparcos-Gaia proper motion anomaly

*Thursday 10 July 2025 09:45 (15 minutes)*

I wish to present a new tool called GaiaPMEX, introduced in two recent papers (Kiefer et al. 2024 a, b). It characterizes the mass and semi-major axis relative to the central star (sma) of any possible companion around any source observed with Gaia. It uses for the first time the value of RUWE published in the DR3 archives, and when available, combines it with the Gaia-Hipparcos proper motion anomaly (PMa). Most importantly, it infers for any star the astrometric noises actually present in Gaia DR3 observations. It thus obtains accurate constraints on the properties of companions, debiased from possible instrument-related scatter. One of my goals is to exploit the billions of sources in Gaia's DR3 to find massive samples of exoplanet candidates to the disposal of future follow-up projects. I first focused on the 77 millions of bright ( $G < 16$ ) Gaia sources. Modeling their RUWE with GaiaPMEX, I identified a sample of 9,698 planet candidate hosting sources, whose companion may have a mass  $< 13.5 \text{ MJup}$  in the range of 1-3-au sma. This input catalog for massive exoplanets surveys will be made public soon, and I wish to explain how it has been obtained, and how it could be used by others, ahead of the publication of the DR4.

Paper I, Kiefer et al. 2024 a: <https://arxiv.org/abs/2409.16992>

Paper II, Kiefer et al. 2024 b: <https://arxiv.org/abs/2409.16993>

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