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Determining the mass of RV exoplanet candidates using Gaia

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Mass is one of the most important parameters for determining the true nature of an astronomical object. Yet, many published exoplanets in on-line database, such as exoplanet.eu or the NASA exoplanet archive, still lacks a measurement of their true mass, in particular those detected thanks to radial velocity (RV) variations of their host star. For those, only the minimum mass, or m sin(i), is known, owing to the insensitivity of RVs to the inclination of the detected orbit compared to the plane-of-the-sky. The mass that is given in database is generally that of an assumed edge-on system (90 degrees), but many other inclinations are likely, even extreme values closer to 0 degree (face-on configuration). In such case, the mass of the published object could be strongly underestimated, even by 1 or 2 orders of magnitude. We used a recently developed tool, called GASTON (Kiefer et al. 2019b & 2019c), to take advantage of the voluminous Gaia astrometric database, in order to constrain the inclination and true mass of several hundreds of published exoplanet candidates (Kiefer et al. 2020, submitted). In this presentation, we will present the method and report on several exoplanet candidates reclassified in the stellar domain, among which unknown brown/M-dwarf. We also confirm the planetary nature of a few tens of candidates.