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Robustness of eccentricity estimates

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The eccentricity of a planet is a key information on its present dynamics and puts constraints on formation scenarios. However, eccentricity estimates are known to be subject to caution, for instance it has been shown that low eccentricities are on average overestimated. In this talk, we present a comprehensive study of the eccentricity estimation from radial velocity data and give conditions for robust inference. We address in particular whether the estimates can be trusted even if the model used for the data analysis is incorrect. By that we mean that the data contains unmodelled stellar noises, missed planetary companion, poorly chosen priors... We present which types of modelling errors affect most the eccentricity estimates, and also discuss the numerical errors effects. We suggest data analysis methods to determine if the eccentricity of a planet is to be trusted or if it is an artefact of an inappropriate modelling.

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