Impact of stellar variability on future Earth-like planets detectability and characterization in radial velocity

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Résumé

stars when using the radial velocity technique. In addition to the impact of dark spots and bright plages, surface flows at different time scales (granulation, supergranulation, meridional circulation) also lead to RV variations (Meunier 2021), most with a much larger amplitude than an Earth-like signal. After introducing this challenge and the stellar processes affecting RVs, we will present our approach: we used our knowledge of solar activity to produce a large amount of realistic synthetic time series for other solar-type stars. We will show recent results (Meunier+2023) base on large-scale blind tests performed to better understand some limitations in mitigating techniques, to estimate the performance (detection and mass characterization), focusing on Earth-like planets in the habitable zone around solar-type stars. We will discuss possibilities to improve performance in order to reach PLATO objectives.

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