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# Stellar Magnetism and the effects on exoplanet environments

Conrad Vilela-Lewandowski<sup>\*1</sup>

<sup>1</sup>Keele University – Astrophysics Group, Keele University, Keele, Staffordshire, ST5 5BG, United Kingdom, United Kingdom

## Abstract

We investigate the influence of stellar magnetic behaviour on the estimation of the physical and geometrical properties of exoplanet systems and the effect that the exoplanet itself may have on stellar magnetism. We statistically analyse the high precision light curves of known Kepler planets in search of correlations between starspot coverage and excess UV and X-ray emission, which can induce irradiation-driven mass-loss on the exoplanet atmospheres. Furthermore, we present the influence of starspots on the estimation of the physical properties of exoplanets such as, radius and density. We also search for possible interactions between the exoplanet and the stellar magnetic dynamo which can lead to possible orbital circularization, tidal locking and synchronisation between orbital periods and stellar rotation. Results show that exoplanets orbiting highly active stars can have their radius underestimated by  $\sim 3\%$ . In addition, we find a similar effect on orbital semi-major axis and mid-transit point. We also identify synchronisation between planet orbital period and stellar rotation.

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<sup>\*</sup>Speaker