

How stellar winds can affect atmospheric escape in close-in exoplanets

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Abstract

The atmospheres of highly irradiated exoplanets are observed to undergo hydrodynamic escape, resulting in planetary mass loss. However, stellar winds can shape and even prevent atmospheric escape, affecting observable signatures of escape such as Lyman-alpha and H-alpha line profiles. In this work, we simulate atmospheric escape of close-in exoplanets and investigate whether they are affected by stellar winds. We show that, although younger hot-Jupiters experience higher levels of atmospheric escape, owing to a favourable combination of higher irradiation levels and weaker planetary gravity, stellar winds are also stronger at this young age, which act as to reduce/inhibit escape rates of young exoplanets.

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