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Effect of flares on the chemical composition of exoplanets atmospheres

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Abstract

M stars are very abundant in our Galaxy, and very likely harbour the majority of planetary systems. But a particularity of M stars is that they are the most active class of stars. Indeed, they experience stellar variability such as flares. These violent and unpredictable outbursts originate from the photosphere and are caused by magnetic processus. During such an event, the energy emitted by the star can vary by several orders of magnitude for the whole wavelength range. It results in an enhancement of the H_α emission and of the continuum. Different studies on the effect of flares on exoplanets have already been conducted [1, 2]. Here we are interested in the effect of a flare on the atmospheric composition of a warm Neptune orbiting around an M star. Using the stellar flux of AD Leo recorded during a flare event [1] and the chemical model of [3], we have studied the impact on the atmosphere. We have also computed the synthetic spectra assuming that such an event occurs during a transit. We will present these results.

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References

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