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Surface-atmosphere interactions on hot rocky exoplanets

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Hot-rocky exoplanets with surface temperatures above 1500 K are thought to support magma oceans. The presence of these magma oceans offers a unique opportunity for inferring the interior composition of these planets through the characterization of their atmosphere. With hundreds of hot-rocky exoplanets discovered and a dozen of good targets for JWST characterisation, understanding the links between the interior and atmospheres of these worlds and what we can learn from the observations is more relevant than ever.

With this goal in mind we developed a chemical equilibrium code able to calculate the composition of a gas vapor above a magma ocean of a given composition, temperature and surface pressure. By coupling this to atmospheric chemistry and radiative transfer codes we are able to produce model spectra for different hypothetical mantle compositions, showing us what we need to be looking for to identify magma oceans. In this ongoing work we are also working on the influence of water on the interiors and atmospheres of these planets. In this talk we will explain how we went about developing LavAtmos, the initial results of its application, and what this means for the observability of hot rocky exoplanet atmosphere and the ability to detect magma oceans.

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