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Transmission spectroscopy of a tidally distorted extremely hot Jupiter

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Abstract

During planetary transit, stellar light is filtered through an exoplanet's atmosphere, revealing the planet's atmospheric properties through wavelength-dependent absorption features. An increasing number of transmission spectra have been observed to date, forming a key data set for constraining planetary atmospheric compositions and have also revealed atmospheric aerosols in the form of clouds and hazes as a common feature in exoplanet atmospheres. We have been conducting a survey of transmission spectra of a sample of hot giant planets with large ground-based facilities, using FORS2 at the ESO VLT and GMOS at the Gemini telescope.

In this talk, we present the first high-precision transmission spectrum of WASP-103b, showcasing the performance of ground-based multi-object spectroscopy for the characterization of planetary atmospheres. WASP-103b, a planet which is at the brink of tidal disruption by its host star, is one of the most massive (1.5 M_J) and hottest (2500 K) planets characterized so far through transmission spectroscopy. We will present results on the Na and K absorption features in the planetary atmosphere and discuss these measurements in context, comparing WASP-103b to other hot Jupiters in their final stages of life.