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Transmission spectra of giant and terrestrial exoplanets in the IR

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We present here simulations of transmission spectra in the IR of extrasolar giant planets, HD209458b and HD189733b, during their transit in front of their parent star (Tinetti et al., 2007). If H2O and CO are abundant as estimated by our photochemical model (Liang et al., 2004), we expect they can be detected with the IRAC and MIPS cameras on board the Spitzer Space Telescope. According to our simulations, transmission spectra of EGPs in the IR are very sensitive to molecular abundances and less to temperature. Temperature influences the spectra above all by way of its effects on the atmospheric scale height and absorption coefficients. These considerations make transmission spectroscopy, linked with primary transit, an approach worth considering. The next generation of space telescopes (James Webb Space Telescope, JWST, 2013) will have the capability of acquiring spectra of smaller extrasolar worlds. To understand our ability to characterize neptune- and earth-size transiting exoplanets, we have generated synthetic transmission spectra of these exotic environments, using a set of chemistry, climate and radiative transfer models. In this presentation we will focus on the detectability of spectral signatures of crucial atmospheric molecules with future observations.