Titre: Linking Atmospheric Dynamics to Doppler Shifts in High-Resolution Transmission Spectroscopy

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Studying the atmospheric dynamics of exoplanet atmospheres is often hindered by our inability to access dynamical quantities directly. Wind speeds of exoplanets can in theory be evaluated from the Doppler shift measurements using high-resolution transmission spectroscopy. However, different factors can bias the wind measurements obtained from the observations, including 3D thermal and chemical structure.
Here we calculate the transmission spectra of a grid of 3D global circulation models of hot and ultra-hot Jupiters. We investigate the relationship between the measured Doppler shift of iron absorption lines and the wind speed in the planetary atmosphere. We find that, for most planets, the systematic velocity shift measured during a transit should be a good approximation of the day-to-night atmospheric wind speed. This breaks down, however, for fast rotators, and we therefore propose a new metric to link wind speed and observations for these planets.