

Phase-differential NIR integral field spectroscopy of transiting extrasolar planets

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The technique of choice for spectroscopy of transiting extrasolar planets is to cancel the stellar contribution by using a differential method: Before the planet is disappearing during a superior conjunction (SC) or after its recurrence the observable signal is the sum of the light from the planet, the star, and various background contributions. During the SC, the planetary contribution is missing, while during an inferior conjunction (IC) the planetary atmosphere absorbs parts of the stellar signal. Analyzing the differences between those observations should reveal the planetary spectrum. We present results of an exploratory study to use adaptive optics-assisted integral field spectroscopy to obtain H- and K-band spectra of transiting Hot Jupiters and emphasize the importance of observing strategy and exact timing. We demonstrate how integral field spectroscopy compares with other spectroscopic techniques currently applied. We have tested our concept with time series observations of HD209458b during a superior conjunction and HD189733b during inferior conjunction obtained with SINFONI at the VLT at a spectral resolution of $R = 1500$.