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Title: Transit transmission spectroscopy with GTC: First results
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Abstract: Our group is presently conducting an observational campaign, using the 10-meter Gran Telescopio Canarias (GTC), to obtain long-slit spectra in the optical range of several planetary host stars (and a reference star) during a transit event. The GTC instrument OSIRIS consists of two CCD detectors with a field of view of 7.8×7.8 arcmin and plate scale of 0.127 arcsec/pix. We used OSIRIS in its long-slit spectroscopic mode, selecting the grism R1000R which covers the spectral range of 520-1040 nm, and a custom-built slit of 12 arcsec of width. We integrate the stellar flux of both stars in different wavelength regions producing several light curves and fit transit models in order to obtain the star-to-planet radius ratio R_p/R_s across wavelength. A Markov Chain Monte Carlo (MCMC) Bayesian approach is used for the transit fitting, and the level of red noise in the light curves is estimated using the method of Winn et al. (2008).

Here, we will present refined planet parameters, planet color signatures and the transmission spectrum of a set of known transiting exoplanets, namely: WASP-43b, HAT-P-32b, HAT-P-12b, WASP-48b, and KIC 12557548b. With our instrumental setup, GTC has been able to reach precision down to 250 ppm (WASP-48b, $V=11.06$ mag) for each color light curve XX nm wide. We will also discuss the capabilities and advantages of GTC as tool for the follow up of faint Kepler targets, such as KIC 12557548b.