

EXPLORING THE ATMOSPHERES OF EXOPLANETS USING THE GTC

E. Pallé¹, G. Chen¹, and the IAC exoplanet team

¹Instituto de Astrofísica de Canarias

Introducción: Our group has conducted an observational campaign, using the 10-meter Gran Telescopio Canarias (GTC), to obtain the transmission spectrum of several exoplanets during a transit event.

The GTC instrument OSIRIS is used in its long-slit spectroscopic mode, covering the spectral range of 520-1040 nm, and observations are taken using a set of custom-built slits of various, broad, widths. 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. We will show that with our instrumental setup, OSIRIS has been able to reach precisions down to 200 ppm) for each color light curve 10 nm wide, in a single transit. And accuracies of the order of 500ppm can be obtained for objects with $V=16$ (eg. CoRoT-29b). Central transit timing accuracies have been measured down to 6 seconds.

Moreover, we have recent results with the use of EMIR as a new tool to characterize exoplanet atmospheres in the near-infrared range, and we will discuss its possibilities. Observations with HiPERCAM are also in preparation.

Here, we will present refined planet parameters, the detection of planet color signatures, and the transmission spectra of a set of known and unpublished transiting exoplanets. We will also discuss the capabilities and limitations of GTC with current and future instrumentation.