

High quality fast photometry of a highly irradiated transiting exoplanet WASP-12 b

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Abstract

Close-in hot Jupiters are known to be surrounded by extended clouds of absorbing gas. WASP-12 b is one of the most irradiated exoplanets discovered thus far and is likely to be undergoing significant mass loss. Previous observations with *Hubble Space Telescope* revealed excess transit depths in the near-UV, pointing towards presence of asymmetric absorbing material in the WASP-12 system. Additional observations were needed to look for signatures of the said material in the visual region of the spectrum, search for the early-ingress phenomenon and potentially uncover colour dependence of gas absorption.

Observations were carried out on *William Herschel Telescope*, following up WASP-12 on three nights in January 2012. Images were taken in u' , g' and NaI bands with ULTRACAM, ultrafast, triple-beam CCD camera with cadence of just 3 sec (for u' & g') and 15 sec (for NaI). Part of data contaminated by a Moon reflection was cleaned using newly developed algorithm ULTRACorrect. Resulting lightcurves show asymmetric transits in g' and NaI bands, potentially signifying excess absorption by the unevenly distributed extended gas enshrouding the system. Additionally, thanks to very high cadence of observations, our data puts stringent constraints on timings of WASP-12 b transits.