

High resolution day-side spectroscopy of the hot gas giant HD 102195b

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Recent observations of the transiting hot Jupiter HD189733b with the GIANO infrared (0.9-2.45) μm spectrograph at the Telescopio Nazionale Galileo have successfully proven that a 4-m class telescope with a performing high-resolution spectrograph can successfully study the atmospheres of exoplanets at high spectral resolution ($R\sim 50,000$).

Here we report on day-time spectroscopy observations with GIANO of the non-transiting hot giant planet HD102195b, aimed at detecting water vapour in its atmosphere. We employ a technique to disentangle the Doppler-shifted planet spectrum (whose individual lines are resolved at high spectral resolution) from the stationary telluric/stellar components. We then extract the planetary signal by cross-correlating the residual spectra with template models of the planet atmosphere computed through line-by-line radiative transfer calculations, and containing molecular absorption lines from water and methane. Based on this analysis, we present a preliminary detection of water in the atmosphere of HD102195b, and a first estimate of the planet's true mass and inclination angle of the orbital plane.

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