

TOI-150b and TOI-163b : two transiting hot Jupiters, one eccentric and one inflated, revealed by TESS near and at the edge of the JWST CVZ

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Abstract

We present the discovery of TYC9191–519–1b (TOI–150b, TIC 271893367) and HD271181b (TOI–163b, TIC 179317684), two hot Jupiters initially detected using 30–min cadence Transiting Exoplanet Survey Satellite (TESS) photometry from Sector 1 and thoroughly characterized through follow–up photometry (CHAT, Hazelwood, LCO/CTIO, El Sauce, TRAPPIST–S), high–resolution spectroscopy (FEROS, CORALIE), and speckle imaging (Gemini/DSSI), confirming the planetary nature of the two signals. A simultaneous joint fit of photometry and radial velocity using a new fitting package JULIET reveals that TOI–150b is a 1.254 ± 0.016 RJ, massive ($2.61 + 0.19 - 0.12$ MJ) hot Jupiter in a 5.857–d orbit, while TOI–163b is an inflated (RP = $1.478 + 0.022 - 0.029$ RJ, MP = 1.219 ± 0.11 MJ) hot Jupiter on a P = 4.231–d orbit; both planets orbit F–type stars. A particularly interesting result is that TOI–150b shows an eccentric orbit ($e = 0.262 + 0.045 - 0.037$) which is quite uncommon among hot Jupiters. We estimate that this is consistent, however, with the circularization time–scale, which is slightly larger than the age of the system. These two hot Jupiters are both prime candidates for further characterization – in particular, both are excellent candidates for determining spin–orbit alignments via the Rossiter–McLaughlin (RM) effect and for characterizing atmospheric thermal structures using secondary eclipse observations considering they are both located closely to the James Webb Space Telescope (JWST) Continuous Viewing Zone (CVZ).

Keywords

Photometric, Planets, Satellites, HD271181, TIC 179317684, TIC 271893367, TYC9191-519-1.