



Transiting Exoplanets from the Corot Space Mission: Corot-21b – a large Jupiter-like planet around a faint subgiant

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Abstract

Corot-21, a FIV8 star of magnitude 16, was observed by the space telescope Corot during the Long Run 01 (LRa01) in the constellation Monoceros from October 2007 to March 2008. A transit was discovered during the lightcurve processing. Radial velocity follow-up observations, however, were performed by the 10-m Keck telescope mainly in January 2010. The companion Corot-21b is a Jupiter-like planet of (2.53 ± 0.33) Jupiter masses and (1.299 ± 0.004) Jupiter radii in an orbit of semi major axis 0.0417 AU and an orbital period of 2.72 days. The planetary bulk density is (1525 ± 240) kg/m³ and follows in first order a $M-R^{1/3}$ relation like Jupiter. The FIV8 star is a sub-giant of (1.29 ± 0.09) solar masses and (1.95 ± 0.2) solar radii. Both, the star and the planet exchange extreme tidal forces which will lead to orbital decay within 4 Gy if the stellar dissipation is less than 10^8 .