



The 55 Cancri System: Fundamental Stellar Parameters, Habitable Zone Planet, and Super- Earth Diameter

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(Submitted on 11 Jul 2011)

The bright star 55 Cancri is known to host five planets, including a transiting super-Earth. We use the CHARA Array to directly determine the following of 55 Cnc's stellar astrophysical parameters: $R=0.943 \pm 0.010 R_{\odot}$, $T_{\text{EFF}} = 5196 \pm 24$ K. Planet 55 Cnc f ($M \sin i = 0.155 M_{\text{Jupiter}}$) spends the majority of the duration of its elliptical orbit in the circumstellar habitable zone (0.67--1.32 AU) where, with moderate greenhouse heating, it could harbor liquid water. Our determination of 55 Cancri's stellar radius allows for a model-independent calculation of the physical diameter of the transiting super-Earth 55 Cnc e ($\approx 2.1 R_{\text{earth}}$), which, depending on the assumed literature value of planetary mass, implies a bulk density of $0.76 \rho_{\text{earth}}$ or $1.07 \rho_{\text{earth}}$.

Comments: 2 pages, 1 figure, 1 table. To appear in "Transiting Planets, Vibrating Stars, and Their Connection", Conference Proceedings of the 2nd CoRoT Symposium, Eds: A. Baglin, M. Deleuil, E. Michel, C. Moutou

Subjects: **Earth and Planetary Astrophysics (astro-ph.EP)**; Solar and Stellar Astrophysics (astro-ph.SR)

Cite as: **arXiv:1107.1936 [astro-ph.EP]**
(or **arXiv:1107.1936v1 [astro-ph.EP]** for this version)

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