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Modeling The Interior of A Super-Earth Candidate From Stellar Metallicities To Infer Geophysical Properties ROGER HART, BRENDAN BRITTON, Community College of Rhode Island — Exoplanet mass, radius, and eccentricity relationships are the only data that can be extracted from the exoplanets for planetary characterization. One property of exoplanets that is of current interest to the astronomical community is planetary habitability. Multiple studies have molded the interiors of exoplanets (e.g., Seager et al., 2007; Zeng Seager, 2008; Zeng Sasselov, 2013; Zeng et al., 2016), also studies have been completed by utilized spectral stellar metallicity to model the interiors of rocky exoplanets (Unterborn et al., 2017a; Unterborn et al., 2017b; Hinkel et al., 2018), and the modeling code, ExoPlex, generated by Lorenzo (2018). We build on these prior works by investigating HD 40307g, a super-Earth candidate around a K2.5V a K-type main sequence star (Tuomi et al., 2018). We use modeling derived from ExoPlex (Lorenzo, 2018) and equations of state (EOS) modeling in both Zeng Seager (2008) and Zeng et al. (2018), to infer bulk interior structure and mineralogical compositions. Major mineral phases identified were silicates (Mg,Fe)SiO_3) for the mantle and a Fe-rich core. We interpret the exoplanet model in the context of possible geodynamic processes to prospect the geophysical properties influencing habitability of a plausible rocky HD 40307g.

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