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Sensitivity Studies of Nuclear Reaction Rates for Type-I X-Ray Burst[1] CHOWDHURY IRIN SULTANA, JESSICA BOROWIAK, JACOB ELLIOTT, ALFREDO ESTRADE, Central Michigan Univ, BRADLEY S. MEYER, Clemson Univ, HENDRIK SCHATZ, Michigan State Univ — Type-I X-ray bursts are frequently occurring thermonuclear runaways on the surface of an accreting neutron star. The different nuclear reactions that empower the cataclysmic event play a key role in model-observation comparison. We investigate the effect of the uncertainties in the nuclear reactions using ONEZONE model for a set of different compositions of the material accreted from the companion star. We obtain conditions at burst ignition by simulating the settling process of the accreted material with a full reaction network and compare results to a semi-analytical model. Afterward, we perform a sensitivity of the X-ray burst by varying proton and alpha-induced reaction rates in JINA REACLIBV2.2 within representative nuclear physics uncertainties. We will present the result for the sensitivity to nuclear reactions that have an impact on the X-ray burst light curve and ash production. This result will benefit future experimental work to understand the structure of accreted neutron stars.

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