

Abstract Submitted
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Reaction rates that limit ^{44}Ti from core-collapse supernovae as dense matter constraint: Shocking results¹ SHIV SUBEDI, ZACH MEISEL, GRANT MERZ, Ohio University — Recent observational advances have enabled high resolution mapping of ^{44}Ti in core-collapse supernova (CCSN) remnants. Comparisons between observations and 3D models provide stringent constraints on the CCSN mechanism. However, recent work has identified several uncertain nuclear reaction rates that influence ^{44}Ti and ^{56}Ni production in model calculations of shock-driven nucleosynthesis. We evolved $15M_{\odot}$, $18M_{\odot}$, $22M_{\odot}$ and $25M_{\odot}$ stars from ZAMS to CCSN in MESA (Modules for Experiments in Stellar Astrophysics) and investigated previously identified sensitivities of ^{44}Ti and ^{56}Ni production in CCSN to varied reaction rates. I will present our final results of this sensitivity study. I will also briefly discuss ongoing experimental work motivated by this study namely a direct cross section measurement of $^{39}\text{K}(p,\gamma)^{40}\text{Ca}$.

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