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Nucleosynthesis COnstraints on the Explosion Mechanism for Type IA Supernovae[1] GRANT MATHEWS, Univ of Notre Dame, KANJI MORI, TOSHITAKA KAJINO, NAOJ, TOSHIO SUZUKI, Nihon U., PETER GARNAVICH, Univ of Notre Dame, ROLAND DIEHL, MPI, SHING-CHI LEUNG, KENICHI NOMOTO, IMPU, MICHAEL FAMIANO, WMU — We consider observational constraints from iron-group elemental and isotopic ratios, to compare with various models. The nucleosynthesis is sensitive to highest white-dwarf central densities. Hence, nucleosynthesis yields can distinguish high-density Chandrasekhar-mass models from lower-density burning models such as white-dwarf mergers. We discuss results of post-processing nucleosynthesis from a number of representative models. These include 1D explosion models (deflagration and/or delayed detonation models) along with 2D and 3D explosion models (including deflagration, delayed-detonation, or a violent merger models). We identify some trends in observations and the models. We compare the models with elemental and isotopic rations from two observed supernovae and three supernova remnants. We find that the models and data tend to fall in two groups. In one group low-density cores such as in 3D merger or deflagration models are most consistent with the nucleosynthesis data, while the other group is best identified with higher-density cores such as in single-degenerate !D delayed detonation models. Hence, we postulate that both types of environments contribute nearly equally to observed SNIa.

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Grant Mathews
Univ of Notre Dame

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