Abstract Submitted
for the SES15 Meeting of
The American Physical Society

Nucleosynthesis in Type II Supernova[1] CARRIE ELLIOTT, University of Tennessee Knoxville, WILLIAM R HIX, Astronomy Coordinator (UTK) and Group Researcher, AMOS MANNESCHMIDT, Undergraduate reseracher - UTK, AUSTIN HARRIS, PhD student - UTK, SUPERNOVA TEAM TEAM[2] — Type II Supernovae are the most common class of the "core collapse" supernovae. These dramatic events involve the violent destruction of a high mass star (greater than approximately 8 solar masses). Their death is a result of an immense self-gravitational force becoming unbalanced as nuclear fusion ceases in the stellar core, leading to the collapse of the core to form a neutron star. The development of the explosion launches a shockwave that causes fusion into heavier elements as it progress through the star. This results in the production of most of the heavy elements in the universe. The complex nature of the explosion (its hydrodynamics, transport of energy, and the created isotopes) have recently been studied with increasing physical fidelity and spatial dimensionality. Detailed nucleosynthesis from models of these supernovae is calculated in a post-processing step, using the thermodynamic trajectories of tracer particles evolved within the models. My work on the project has been to develop the tools to visualize the results of post-processing calculations on the multi-dimensional grid of the original model. I have improved upon a simple nearest-neighbor method of interpolation of density in-between elements to account for the issues with initial particle alignment and boundaries, to develop a smooth interpolation free of gaps or bands. This smooth interpolation can also be applied the re-mapping of isotope abundance to provide a visual presentation of the distribution of isotopes in the exploding star through a program called SPLASH. Once the 2-D method is satisfactory, we will consider ways in which to move to 3-D.

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Date submitted: 19 Oct 2015 Electronic form version 1.4