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**r-Process Sensitivity Studies of Beta-Delayed Neutron Emissions**[1]

MATHEW GISO, Union College — The r-process is a nucleosynthesis mechanism responsible for the formation of elements heavier than iron. It is unclear where in the galaxy the r-process occurs, but the two most likely locations are supernovae and neutron star mergers. This process is complex, and different initial conditions have a large affect on the resulting abundances of the elements produced. Using an r-process nuclear network code, we examined influence of beta-delayed neutron emissions (BDNE) probabilities. We tested single isotopes of every element with BDNE either maximized or turned off, while all other nuclei were held at their normal theoretical BDNE probability. The results were compared with a baseline, and we looked for local and global changes to the final abundance patterns. BDNE probabilities for nuclei 5-15 neutrons from stability were found to have the most substantial effects. Results with BDNE maximized had the most drastic changes from baselines.

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