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Comparing Neutron Capture and Beta Decay r-Process Sensitivity Studies CHRISTOPHER ALLEN, SEAN COLLISON, ANA MIKLER, REBECCA SURMAN, Union College — We used sensitivity studies for r-process nucleosynthesis to determine which pieces of nuclear data are most important for the r-process, as well as develop an understanding of how the r-process proceeds. This summer we compared a neutron capture rate sensitivity study with a beta decay rate sensitivity study. The neutron capture rate sensitivity study procedure began with successful r-process conditions. We then ran a baseline simulation then repeated the simulation thousands of times with the neutron capture rate of each nucleus individually modified by a factor of 100. The results were run compared with a beta decay sensitivity run with the same astrophysical conditions. There was a slight correlation between the sensitivity measures of each type of nuclear data. The differences between the neutron capture and beta decay sensitivity studies can be explained by understating the mechanism that each individual neutron capture rates and individual beta decay rates influence the r-process.

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