

Abstract Submitted
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Sensitivity Study Investigating the Effect of Nuclear Masses on R-process Abundances¹ NANCY PAUL, University of Notre Dame, SAMUEL BRETT, University of Surrey, ANI APRAHAMIAN, University of Notre Dame — Nuclear masses play a critical role in r-process nucleosynthesis, which, though poorly understood, is thought to account for more than 50 percent of the abundances of elements heavier than iron. Using the NGAM nucleosynthesis simulation code and the FRDM mass model, we performed a sensitivity study to identify nuclei whose masses have the greatest impact on the entire r-process abundance distribution. We adjusted the individual FRDM masses by 25 percent and evaluated the overall impact compared to baseline abundances generated from the FRDM masses. We determined the effects of these adjustments by considering both the maximum change and the RMS change in final r-process abundances. We identified several critical nuclei that would be most important to measure in future experiments at radioactive ion-beam facilities although not all nuclei are experimentally accessible at the present time.

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Nancy Paul
University of Notre Dame

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