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Global Monte Carlo Calculations for r-process Nucleosynthesis¹ MATTHEW MUMPOWER, REBECCA SURMAN, ANI APRAHAMIAN, University of Notre Dame — The rapid neutron capture process is believed to be responsible for the production of approximately half of the heavy elements above iron on the periodic table. Nuclear physics properties (e.g. nuclear masses, neutron capture rates, β -decay rates, and β -delayed neutron emission branching ratios) are critical inputs that go into theoretical calculations of this nucleosynthesis process. We highlight the current capabilities of nuclear models to reproduce the pattern of solar *r*-process residuals by performing global Monte Carlo variations of the uncertain nuclear physics inputs. We also explore the reduction in uncertainties that may arise from new measurements or improved modeling and discuss the implications for using abundance pattern details to constrain the site of the *r* process.

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