Abstract Submitted
for the DNP13 Meeting of
The American Physical Society

The sensitivity of r-process nucleosynthesis to beta-delayed neutron emission probabilities[1] REBECCA SURMAN, Union College, MATTHEW MUMPOWER, ANI APRAHAMIAN, University of Notre Dame — In the classic picture of rapid neutron capture, or r-process, nucleosynthesis, the heaviest elements are formed far from stability in conditions of (n, γ)-(γ, n) equilibrium. When equilibrium fails, neutron captures, photodissociations, and beta decays all compete as material moves back toward stability. The beta decays of the very neutron-rich nuclei created in the r-process are often followed by the emission of one or more neutrons. This beta-delayed neutron emission plays a key role in setting the final abundance pattern during the decay back to stability. Here we describe how beta-delayed neutron emission probabilities determine the availability of neutrons for capture at late times in the r-process, and discuss the importance of individual P_n values in fixing the details of the r-process abundance pattern. We will point out the beta-delayed neutron emission probabilities that most strongly influence the r-process abundance pattern in a range of possible astrophysical scenarios.

[1]This work was supported by the National Science Foundation under grant number PHY1068192 and through the Joint Institute for Nuclear Astrophysics grant number PHY0822648, and the Department of Energy under contract DE-FG02-05ER41398

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Date submitted: 01 Jul 2013 Electronic form version 1.4