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New calculations of β-delayed neutron emission MATTHEW MUMPOWER, Univ of Notre Dame, TOSHIHIKO KAWANO, PETER MOLLER, Los Alamos National Lab — β-delayed neutron emission probabilities (Pn-values) are important inputs for nuclear astrophysics applications. We present a new model of β-delayed neutron emission which combines QRPA and statistical decay calculations. This approach uses microscopic nuclear structure information which starts with Gamow-Teller strength distributions in the daughter nucleus, and then follows the statistical decay until the initial available excitation energy is exhausted. Explicitly included at each neutron emission stage is γ-ray competition. One consequence of this formalism is a prediction of more neutrons on average being emitted after β-decay for neutron-rich nuclei towards the neutron dripline. The framework presented here also enables us to extend our calculations to beta-delayed fission and pre-scission neutron emission. We discuss implications of larger Pn-values and new β-delayed fission rates for the astrophysical r process of nucleosynthesis.

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