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Beta-decay and neutron emission - a strained relationship

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Beta-delayed neutron emission is an important decay mode for very neutron-rich nuclei. For the highly asymmetric nuclei, nuclear structure and large decay energies can affect neutron emission probabilities. Experiments at the ISOLDE Decay Station (IDS) and the FRIB Decay Station Initiator (FDSi) provided a wealth of new data, leading to spectroscopy of beta-delayed two-neutron emission [Dys25], new cases of neutron-gamma competition [Pie21, Xu23], and observations of non-statistical effects [Xu24, Bra26]. The data do not necessarily agree with the established models for this process, and to make reliable predictions of neutron-emission branching ratios for more exotic r-process nuclei, the inconsistencies need to be understood. The experimental data are still scarce and scattered, but measurements on exotic isotopes are essential for developing a better model of beta-delayed neutron emission.

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