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Systematics of beta-delayed neutron emission probabilities

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We explore the systematics of beta-delayed neutron emission probabilities both globally and in regions relevant to applications, such as decay heat calculations. Traditionally, correlations were sought by investigating the P_n value as a function of the Q value of the decay (or some relation involving Q). Here, we present systematics of the ratio $P_n/T_{1/2}$ and find a strong correlation as a function of the energy available for the beta-delayed neutron decay, $Q_{\beta n}$. Such a relation can be used to predict P_n values for cases where the half-life is known and could be of relevance to r-process calculations or predictions of advanced fuel cycles. Correlation schemes such as these rely on a precise knowledge of P_n values. To contribute to the available data, new, precise measurements of P_n values are planned at the CARIBU facility at Argonne National Laboratory. A brief description of a proof-of-principle case in ^{138}I will be given.

Primary author: MCCUTCHAN, Elizabeth (Brookhaven National Lab)

Co-authors: SONZOGNI, Alejandro (Brookhaven National Lab); JOHNSON, Timothy (Brookhaven National Lab)

Presenter: MCCUTCHAN, Elizabeth (Brookhaven National Lab)

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