AUTOPSY OF BETA DECAYS WITH VANDLE

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Exotic neutron-rich nuclei are predominantly beta delayed neutron emitters. Complete spectroscopy of the decay pattern, which includes energy measurement of emitted neutrons and gammas is necessary to provide the detailed data on beta feeding. This knowledge is required to extract the beta decay strength distribution for testing nuclear structure models.

A series of measurements was performed with the Versatile Array of Neutron Detectors at Low Energy (VANDLE) at decay stations at ORNL, ANL, and CERN near doubly magic 78Ni and 132Sn. These measurements probe the feeding of the neutron-unbound states in beta decay daughter nuclei. A comprehensive interpretation of the results was obtained using shell model calculations capable of predicting cross-shell excitations.

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