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Performance of the Neutron dEtector with Xn Tracking (NEXT) prototype.[1] SHREE NEUPANE, JOSEPH HEIDEMAN, ROBERT GRZYWACZ, CORY THORNSBERRY, DAVID PEREZ-LOUREIRO, LAWRENCE HEILBRONN, JOSHUA HOOKER, KYLE SCHMITT, University of Tennessee, MUSTAFA RAJABALI, COLE HOWELL, JOSEPH OWENS, Tennessee Technological University, ERIN PETERS, ANTHONY RAMIREZ, STEVEN YATES, University of Kentucky, THOMAS MASSEY, DOUG SOLTESZ, YENUEL ALBERTY-JONES, JOSEPH DERKIN, University of Ohio, KEITH VAIGNEUR, Agile Technologies, Inc — Recent developments in radioactive ion-beam facilities allow the production of very neutron-rich nuclei. Away from the line of beta stability towards neutron-rich nuclei, β-delayed multi-neutron emission is the dominant decay mode. Neutron dEtector with Xn Tracking (NEXT) has been designed to better measure $\beta-$delayed neutron energies. By segmenting the detector along the neutron flight path, NEXT will reduce the associated uncertainties in neutron time-of-flight measurements, improving energy resolution while maintaining detection efficiency. Detector prototypes have been built using segments of n-γ discriminating plastic scintillator coupled to position sensitive photomultiplier tubes. Results will be presented from the tests of position-timing correlations and efficiency measurements using neutrons produced from (p,n) and (d,n) reactions.

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