

Abstract Submitted
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Performance of the Neutron dEtector with Xn Tracking (NEXT) prototype.¹ SHREE NEUPANE, JOSEPH HEIDEMAN, DAVID PEREZ-LOUREIRO, ROBERT GRZYWACZ, CORY THORNSBERRY, LAWRENCE HEILBRONN, KYLE SCHMITT, University of Tennessee, MUSTAFA RAJABALI, COLE HOWELL, LEONARD MOSTELLA, JOSEPH OWENS, Tennessee Technological University, ERIN PETERS, ANTHONY RAMIREZ, STEVEN YATES, University of Kentucky, 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 neutron emission is the dominant decay mode. Neutron dEtector with Xn Tracking (NEXT) has been designed to better measure β -delayed neutron energies. By segmenting the detector along the neutron flight path, NEXT will reduce the associated uncertainties in neutron time-of-flight measurement, improve energy resolution while maintaining detection efficiency. A detector prototype has been built using segments of plastic scintillator with n- γ discrimination coupled to position sensitive photomultiplier tubes. The results from the proof-of-principle measurements using a ^{252}Cf neutron source and accelerator-produced mono-energetic neutrons will be presented.

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