

Abstract

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Neutrino-Induced Nuclear Fission

Neutrino-Induced Nuclear Fission has gone several decades without experimental confirmation. Electron neutrinos from a stopped-pion neutrino source like the Spallation Neutron Source at Oak Ridge National Laboratory present a unique opportunity to search for this elusive process by exploiting the high energy electron neutrino spectrum isotopically emitted from the mercury target. A detector consisting of Thorium-232 target material hermetically sealed within Gadolinium loaded mineral oil has the potential to successfully confirm neutrino-induced nuclear fission by collecting a combination the high energy lepton resulting from charged-current neutrino interactions, prompt fission neutrons, and the delayed fission product yield.