

Abstract Submitted
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Search for Radiative Beta-Decay of the Neutron J.S. NICO, M.S. DEWEY, T.R. GENTILE, H.P. MUMM, A.K. THOMPSON, National Institute of Standards and Technology, B.M. FISHER, F.E. WIETFELDT, Tulane University, E.J. BEISE, K. KIRILUK, University of Maryland, J. BYRNE, University of Sussex, T.E. CHUPP, R.L. COOPER, University of Michigan — Beta decay of the neutron into a proton, electron, and antineutrino is occasionally accompanied by the emission of a photon. Despite decades of detailed experimental studies of neutron beta-decay, this rare branch of a fundamental weak decay has never been measured. An experiment to study the radiative beta-decay of the neutron is currently being developed for the NG6 fundamental physics beam line at the NIST Center for Neutron Research. The experimental approach looks for electron-photon coincidences followed by a delayed proton. The need for a large solid-angle photon detector that can operate in a strong magnetic field and at low temperature has led us to employ a photon detector consisting of scintillating crystals coupled to avalanche photodiodes. A single silicon detector is used for registering both electron and proton events. The apparatus has been installed at the NG6 beam line and initial measurements have begun. Analysis of the data indicate that electron-proton rates are as expected and photon background rates are acceptable.

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