

Abstract Submitted
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Search for Oscillation of the Electron-Capture Decay Probability of ^{142}Pm ¹ PAUL VETTER, R.M. CLARK, J. DVORAK, S.J. FREEDMAN, K.E. GREGORICH, H.B. JEPPESEN, D. MITTELBERGER, Lawrence Berkeley National Laboratory, M. WIEDEKING, Lawrence Livermore National Laboratory — We have searched for time modulation of the electron capture decay probability of ^{142}Pm in an attempt to confirm a claim from a group at the Gesellschaft für Schwerionenforschung (GSI) attributed to neutrino oscillation. We produced ^{142}Pm via the $^{124}\text{Sn}(^{23}\text{Na}, 5n)^{142}\text{Pm}$ reaction at the Berkeley 88-Inch Cyclotron with a short bombardment time. Isotope selection by the Berkeley Gas-filled Separator is followed by implantation and a long period of monitoring the ^{142}Nd K_α x-rays from the daughter. The decay time spectrum of the x-rays is well-described by a simple exponential and our measured half-life is consistent with the accepted value. We observed no decay rate oscillation at the frequency reported by Litvinov *et al.* (Phys. Lett. B **664**, 162 (2008)), and no oscillation terms at any frequency were statistically significant. A search for previous experiments that might have been sensitive to the reported modulation uncovered another example in ^{142}Eu electron-capture decay. A reanalysis of the published data shows no decay rate oscillation.

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