

Abstract Submitted
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Time-reversal breaking in isospin-hindered ^{45}K decay¹ J.A. BEHR, A. GORELOV, TRIUMF, J.C. MCNEIL, U. British Columbia, A. AFANASSIEVA, McMaster U., D. MELCONIAN, Texas A & M, M. ANHOLM, G. GWINNER, U. Manitoba — Isospin-hindered Fermi transitions in β decay enhance sensitivity to many sources of time-reversal violation (TRV) [Barroso and Blin-Stoyle [Phys Lett 45B 178 (1973)]. The key concept is that the TRV matrix element is compared to the Coulomb interaction's isospin-breaking matrix element, rather than to the entire decay. We are considering two isospin-hindered Fermi/Gamow-Teller decays, ^{45}K and ^{47}K , for which measurements of the TRV correlation $D\vec{I}\cdot\vec{v}_\beta\times\vec{v}_\nu$ are possible using TRIUMF's Neutral Atom Trap for β decay (TRINAT). Sensitivity could be enhanced by an order of magnitude compared to the Fermi/G-T mirror decay of ^{37}K . We would first measure the needed isospin breaking using the asymmetry of emission of the nuclear progeny with respect to the initial spin, which vanishes for pure G-T decay [J.R.A. Pitcairn et al. Phys Rev C 79 015501 (2009)] and is linear in the isospin breaking matrix element. We will also update use of GAGG scintillators for radiative beta decay TRV experiments.

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