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The emiT Experiment: A Search for Time-reversal Invariance Violation in Neutron Beta Decay H.P. MUMM, M.S. DEWEY, J.S. NICO, A.K. THOMPSON, National Institute of Standards and Technology, A. GARCIA, J.F. WILKERSON, CENPA, University of Washington, T.E. CHUPP, R.L. COOPER, University of Michigan, C.A. TRULL, F.E. WIETFELDT, Tulane University, S.J. FREEDMAN, B.K. FUJIKAWA, University of California at Berkeley, G.L. JONES, Hamilton College — The emiT experiment tests time-reversal symmetry in the beta decay of polarized free neutrons by searching for the time reversal-odd, parity-even triple correlation between the neutron spin and momentum of both the electron and proton. The detection of this correlation above the small calculable effect due to final state interactions would be a direct indication of time reversal symmetry violation, independent of charge conjugation-parity. In the experiment, a beam of cold neutrons is polarized to better than 90% using a supermirror polarizer. Decays are observed using an alternating array of electron and proton detection paddles. The highly symmetric octagonal geometry both reduces systematic effects and increases the detection efficiency relative to many previous experiments. The emiT collaboration has published a result [1] from its first run. A highly successful second run of the emiT experiment has recently been completed at the NIST Center for Neutron Research. The analysis of this greatly improved data set will be presented along with implications for time reversal violation. [1] Phys. Rev. C. 62, 055501, (2000).

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