

Abstract Submitted
for the APR05 Meeting of
The American Physical Society

Design of an Improved Apparatus for a Measurement of the Neutron Lifetime Using Magnetically Trapped Ultracold Neutrons P.-N. SEO, F.H. DUBOSE, R. GOLUB, P.R. HUFFMAN, C.M. O'SHAUGHNESSY, G.L. PALMQUIST, NCSU, J.M. DOYLE, J. OLSON, L. YANG, Harvard University, E. KOROBKINA, HMI, K.J. COAKLEY, H.P. MUMM, A.K. THOMPSON, NIST, G.L. YANG, University of Maryland, S.K. LAMOREAUX, LANL — As a part of an on-going program that seeks to measure the neutron lifetime using magnetically trapped ultracold neutrons (UCN), we are in the process of incorporating a larger and deeper superconducting magnetic trap into our apparatus. The experiment works by loading the trap with UCN through inelastic scattering of 0.89 nm neutrons with phonons in superfluid ^4He . Trapped neutrons are detected when they decay; charged decay electrons ionize helium atoms in the superfluid resulting in scintillation light that is recorded in real time using photomultiplier tubes. We will discuss the design and performance of the new Ioffe-type trap and provide an overview of the statistical sensitivity we expect to reach with the improved apparatus.

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Date submitted: 18 Jan 2005

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