Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

Progress toward a measurement of the shape of the ^{14}C β spectrum[1] ELIZABETH A. GEORGE, PAUL A. VOYTAS, Wittenberg University, L.D. KNUTSON, University of Wisconsin-Madison — Precision beta-decay experiments can constrain possible extensions to the Standard Model of the weak interaction. We report on progress toward a new measurement of the ^{14}C beta spectrum shape as a test of the strong form of the Conserved Vector Current hypothesis. This measurement will complement a previous measurement of the shape factor in the ^{14}O analog transition, which was carried out with a superconducting beta spectrometer[2] and achieved a relative precision of 3% on the linear term of the shape factor[3]. A comparable precision is the goal of the ^{14}C shape measurement. For this measurement we have constructed a new iron-free magnetic beta spectrometer with the same geometry as the ^{14}O spectrometer but with conventional field coils. Because of the low ^{14}C endpoint energy (156 keV), scattering within the spectrometer may cause energy-dependent distortions at the target precision. We report on the design of the spectrometer, Monte Carlo simulations aimed at addressing scattering issues, and results from initial test runs.

[1]Supported in part by NSF grant PHY-1506084
[2]L.D. Knutson *et al.*, Rev. Sci. Instrum. **82**, 073302 (2011).
[3]E.A. George *et al.*, Phys. Rev. C **90**, 065501 (2014).

Elizabeth George
Wittenberg University

Date submitted: 01 Jul 2019 Electronic form version 1.4