Abstract Submitted
for the DNP16 Meeting of
The American Physical Society

^{20}F beta spectrum shape and weak interaction tests[1] PAUL VOYTAS, ELIZABETH GEORGE, THOMAS CHUNA, Wittenberg University, OSCAR NAVILIAT-CUNCIC, MAX HUGHES, XUEYING HUYAN, KEI MINAMISONO, NSCL, Michigan State University, STANLEY PAULAUSKAS, University of Tennessee — Precision measurements of the shape of beta spectra can test our understanding of the weak interaction. We are carrying out a measurement of the shape of the energy spectrum of β particles from ^{20}F decay. The primary motivation is to test the so-called strong form of the conserved vector current (CVC) hypothesis. The measurement should also enable us to place competitive limits on the contributions of exotic tensor couplings in beta decay. We aim to achieve a relative precision better than 3% on the linear contribution to the shape. This represents an order of magnitude improvement compared to previous experiments in ^{20}F. In order to control systematic effects, we are using a technique that takes advantage of high energy radioactive beams at the NSCL to implant the decaying nuclei in scintillation detectors deeply enough that the emitted beta particles cannot escape. The β-particle energy is measured with the implantation detector after switching off the implantation beam. Ancillary detectors are used to identify the 1.633-MeV γ-rays following the ^{20}F β decay for coincidence measurements in order to tag the transition of interest and to reduce backgrounds. We report on the status of the analysis.

[1]Supported in part with awards from the NSCL PAC and the National Science Foundation under Grant No. PHY-1506084

Paul Voytas
Wittenberg University

Date submitted: 01 Jul 2016 Electronic form version 1.4