Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

Radioactive Source Insertion System for the Nab Experiment CHRISTOPHER HAYES, North Carolina State University — The Nab experiment at the Spallation Neutron Source is designed to provide high statistics measurements of the electron-neutrino correlation coefficient and the Fierz interference term in free neutron beta-decay. Of critical importance to the success of Nab is the use of a Radioactive Source Insertion System (RSIS) designed to insert weak conversion-electron sources of known energy into the 70K Ultra High Vacuum (UHV) bore of the Nab magnet–spectrometer. The RSIS incorporates precise positioning of the sources throughout the neutron decay volume to scan individual pixels of two segmented Silicon detecters placed at 5 m and 1.5 m from the source. Beta response functions from individual pixels can then be evaluated for energy loss and calibration of detectors. I will discuss detailed aspects of the RSIS design features including the UHV system outside the magnet, the electro-mechanical system, and requirements for precise motion of the sources.

Christopher Hayes
North Carolina State University

Date submitted: 27 Jun 2019 Electronic form version 1.4