

Abstract Submitted  
for the SES19 Meeting of  
The American Physical Society

**The Nab Experiment: Studying Unpolarized Neutron Beta Decay Correlations** JASON FRY, Eastern Kentucky University, THE NAB COLLABORATION — Neutron beta decay is one of the most fundamental processes in nuclear physics and provides sensitive means to uncover the details of the weak interaction. Neutron beta decay can evaluate the ratio of axial-vector to vector coupling constants in the standard model,  $\lambda = G_A/G_V$ , through multiple decay correlations. The Nab experiment will make measurements of the electron-neutrino correlation parameter  $a$  with a precision of  $\delta a/a = 10^{-3}$  and the Fierz interference term  $b$  to  $\delta b = 3 \times 10^{-3}$  in unpolarized free neutron beta decay. These results aim to deliver an independent determination of the ratio  $\lambda$  that will sensitively test CKM unitarity, independent of nuclear models. Nab utilizes a novel, long asymmetric spectrometer that guides the decay products to two large area silicon detectors in order to precisely determine the electron energy and proton momentum. The Nab apparatus is under installation and commissioning on the Fundamental Neutron Physics Beamline at the SNS at ORNL. We will present updates and an overview of the Nab experiment.

Jason Fry  
Eastern Kentucky University

Date submitted: 30 Sep 2019

Electronic form version 1.4