Abstract Submitted for the SES15 Meeting of The American Physical Society

Neutronics Calculations for the Nab Experiment ELIZABETH SCOTT, Univ of Tennessee, Knoxville, NAB COLLABORATION — The Nab experiment measures the electron-neutrino correlation coefficient "a" and the Fierz interference term "b". Neutron beta decay measurement to a 10^{-3} accuracy gives an independent value of λ , the ratio of axial-vector to vector coupling constants in the nucleon. This accuracy depends on the proton momentum and electron energy with an asymmetric magnetic spectrometer and Si detector. There must be comparatively low background rates to our signal (estimated using neutron decay rate) in order to attain the necessary precision. The collimation and shielding can be modeled using MCNP (Monte Carlo N-Particle) and McStas, a Monte Carlo ray tracing program. I will present a design that optimizes the decay rate while keeping background rates sufficiently low, as well as discuss other sources of background and the corresponding attempts to reduce their rates.

> Elizabeth Scott Univ of Tennessee, Knoxville

Date submitted: 17 Oct 2015

Electronic form version 1.4