

Abstract Submitted
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Nab: precise experimental study of unpolarized neutron beta decay¹ DINKO POCANIC, Inst. for Nuclear and Particle Physics, University of Virginia, NAB COLLABORATION — Nab, a program of experimental study of unpolarized neutron decays at the Spallation Neutron Source, Oak Ridge, TN, aims to determine a , the electron–neutrino correlation with precision of $\delta a/a = 10^{-3}$, and b , the Fierz interference term, with uncertainty $\delta b \simeq 3 \times 10^{-3}$. Neutron beta decay’s simple theoretical description in the Standard Model (SM) is overconstrained by the set of available observables, providing opportunities to search for evidence of SM extensions. Planned Nab results will lead to a new precise determination of the ratio $\lambda = G_A/G_V$, and to significant reductions in the allowed limits for both right- and left-handed scalar and tensor currents. Alternatively, the experiment may detect a discrepancy from SM predictions consistent with certain realizations of supersymmetry. An optimized, asymmetric spectrometer has been designed to achieve the narrow proton momentum response function required to meet the physics goals of the experiment. The apparatus is to be used in a follow-up measurement (ABba) of asymmetry observables A and B in polarized neutron decay. Nab is funded, now in the construction stage, with planned beam readiness in 2016. We discuss the experiment’s motivation, expected reach, design and method.

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