

Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

An experiment to measure the Proton Branching Ratio in Neutron Beta Decay (UCNProBe)¹ MD HASSAN, ZHAOWEN TANG, CHRIS CUDE-WOODS, STEVEN CLYTON, TAKEYASU ITO, Los Alamos National Laboratory, BO JHONSON, Utah State University, MARK MAKELA, CHRIS MORIS, CHRIS O'SHAUGHNESSY, ANDY SAUNDERS, Los Alamos National Laboratory, UCNPROBE COLLABORATION — The free neutron decays into an electron, proton, and antineutrino with a characteristic lifetime with a 100% branching ratio according to the Standard Model. The neutron lifetime has been measured primarily in two methods: the beam method and the ultracold neutron (UCN) bottle method. The lifetime measured in these two methods differs by about five standard deviations. One potential explanation for this discrepancy is that some fraction of neutron decays produce undiscovered decay particles instead of protons. The UCN-ProBe experiment aims to resolve this inconsistency by implying a novel technique to determine the neutron decay branching ratio using a deuterated scintillator box as a UCN storage volume to detect electrons from the beta decay. An overview and update of the UCNProBe experiment will be presented.

¹Department of Energy, Los Alamos National Laboratory LDRD

Md Hassan
Los Alamos National Laboratory

Date submitted: 01 Jul 2019

Electronic form version 1.4