Abstract Submitted
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Ultra-Cold Neutron measurement of Proton branching ratio in neutron Beta decay (UCNProBe)[1] NICK FLOYD, University of Kentucky, MD TAUFIQUE HASSAN, ZHAOWEN TANG, Los Alamos National Laboratory, UCNPROBE COLLABORATION — The free neutron lifetime can be measured using one of two methods: measuring the decay products of neutrons in a well-calibrated neutron beam (beam experiment), or counting the number of surviving neutrons stored in a UCN trap over time (bottle experiment). The lifetime results from the two different methods differ by 10 seconds or five standard deviations. Our goal is to resolve the difference between the two measurements by measuring the proton branching ratio of neutron decay using UCNs. Detecting a proton branching ratio of less than one will indicate new physics beyond the Standard Model of particle physics. The experiment is realized by storing the neutrons in a material trap made from deuterated scintillators. To measure the beta decay lifetime, we will attempt to measure the absolute number of UCNs inside the trap and the absolute number of electrons from beta decay to 0.1 percent precision. In this talk, we will describe the concept of the experiment and report the characterization of the deadlayer of the scintillator.

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