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***In Situ* Detection of Trapped Ultracold Neutrons Using a Vanadium Foil** NATHAN CALLAHAN[1], Indiana Univ - Bloomington — The UCNτ experiment at Los Alamos National Laboratory (LANL) employs a novel *in situ* detector to measure the free neutron lifetime. Ultracold Neutrons (UCN) are confined in a magneto-gravitational trap, held for times on the order of their lifetime, and then counted. The *in situ* detector works by activating a vanadium foil inside the trap with UCN and then raising it into a counter. Vanadium was chosen for its negative material potential (-7 neV), 4 minute half-life, and β/γ coincidence. The activity is measured using a plastic scintillator backed by a NaI array to detect coincidences and reject background. This *in situ* detector has advantages compared to emptying the trap to an external counter: higher activation efficiency, less sensitivity to phase space dependent efficiency, faster absorption time, and the ability to probe phase space evolution in situ. The detector can currently absorb trapped UCN with a time constant of less than 10 seconds and counts with a 19% efficiency. In this talk we will present data taken using this detector during the 2013 run cycle at LANL along with simulations which together characterize the performance of the detector.

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