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Characterization of Solid State Ultracold Neutron Detectors ANNE SALLASKA, ALEJANDRO GARCIA, SKY SJUE, SETH HOEDL, DAN MELCONIAN, University of Washington, ALBERT YOUNG, ADAM HOLLEY, NCSU, PETER GELTENBORT, ILL, UCNA AT LANL COLLABORATION — The reflective properties of ultracold neutrons (UCN) enable easy transport and bottling but make neutron detection a technical challenge. Typically, UCN are allowed to accelerate in the Earth's gravitational field to sufficient velocity to penetrate an aluminum entrance window of a ^{3}He proportional counter. Here we describe the construction and characterization at the ILL of two kinds of prototype solid-state detectors which can be used to monitor the UCN density inside the UCNA spectrometer at LANL without gravitational acceleration, and perhaps more critically, without the danger of ^{3}He leaks. The first type consists of 300 μg/cm^2 of LiF evaporated onto 200 nm thick Ni foils. The second type consists of $\sim 10^{18}$ ^{10}B ions implanted in a 200 nm thick V layer, also evaporated onto Ni foils. From monte carlo simulations, we find that LiF has a critical velocity nearly equal to that of aluminum, whereas the boron foils do indeed have a lower cutoff. Because of these cutoffs and the small size of the detectors, our solid-state detectors, thus, equal (for LiF) or outperform (for Boron) aluminum window proportional counters for *in-situ* density measurements.

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