Abstract Submitted
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Developments in Ultracold Neutron Measurement for the UCNτ experiment NATHAN CALLAHAN[1], Indiana Univ - Bloomington — The UCNτ experiment at Los Alamos National Laboratory (LANL) has constructed and tested a new iteration of its β particle detectors for its *in-situ* vanadium-based neutron detector as well as tested a novel scintillating Ultracold Neutron (UCN) monitor. This talk will discuss developments and results since 2013. Previously the β detector used scintillating paddles coupled to acrylic lightguides of comparable volume and a photomultiplier tube (PMT). The volume of light guide was reduced by using edge-coupled wavelength shifting fibers, providing three benefits: better-shielded PMTs, reduction of background from the light guides, and reduction of dark counts due to smaller PMTs. Data will be presented to characterize these improvements. A novel UCN detector for monitoring was also tested. The new detectors consist of a thin layer of boron coated zinc sulfide scintillator coupled to an acrylic lightguide and a PMT. Boron has a negative material potential, a large cross-section for neutron capture, and decays promptly into an α and a Li ion, allowing high efficiency absorption and detection and low background. Tests to determine the optimal thickness of the boron layer will be discussed as well as comparisons to existing UCN detector performance.

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