Abstract Submitted
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^{10}B Coated LYSO Screens for Detecting Ultra-Cold Neutrons.[1] CHRISTOPHER MORRIS, Los Alamos Natl Lab, UCNTAU TEAM — UCNTau uses ultra-cold neutrons produce by the Los Alamos UCN source to measure the neutron lifetime. The neutrons are stored in the lower section of an asymmetric toroidal neutron trap constructed from a Halbach array of permanent magnets. Neutrons are confined by gravity from the top. The lifetime is measured by loading and storing neutrons from the bottom of the trap and lowering a ^{10}B coated ZnS(Ag) detector from the top to count surviving neutrons at the end of the storage period. Charged particles produced by UCN capture on the ^{10}B produce light in the ZnS, which is captured in an array of wave length shifting fibers and transported to two phototubes to count the neutrons. The long light tail produced in the ZnS introduces pileup and dead time corrections that are a limiting systematic uncertainty at the level of ˜0.1 s, the current goal of our lifetime uncertainty. Cerium doped lutetium oxyorthosilicate/lutetium yttrium oxyorthosilicate (LYSO) is a fast, high light-output scintillator with a very small, long lifetime tail. We have produced 20x20 cm^2 ^{10}B coated screens of LYSO for UCNTau. Construction techniques and tests of this new detector will be presented.

[1]10B Coated LYSO Screens for Detecting Ultra-Cold Neutrons

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