Abstract Submitted
for the DNP15 Meeting of
The American Physical Society

A large surface detector for ultracold neutrons[1] C.L. MORRIS, ZHEHUI WANG, Los Alamos Natl Lab, UCN LIFETIME (UCNTAU) COLLABORATION — A multilayer surface detector for ultracold neutrons (UCNs) that was recently demonstrated will be described. The detector consisted of a top ^{10}B layer around 100 nm thick, a ZnS(Ag) scintillator layer of a few micron thick and a photodetector with a sensitivity down to single photons. Electron-beam evaporation was used to deposit ^{10}B onto commercial ZnS(Ag) coated screens. We are extending the concept to a double-sided large surface (20 cm $\times$ 40 cm) detector for UCN counting in the UCNtau magnetic trap. To minimize the number of photodetectors and readout channels, the scintillator light from the ZnS(Ag) is collected using an array of wavelength shifting fibers. The light loss as a function of position is characterized using a ^{148}Gd alpha source. The detection efficiency as a function of surface roughness is discussed. The detector will be used in the upcoming UCN experiments at the LANSCE UCN facility.

[1]Work supported by the LANL LDRD program.

Zhehui Wang
Los Alamos Natl Lab

Date submitted: 23 Jun 2015 Electronic form version 1.4