

Abstract Submitted  
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**LENS – A Novel Technology to Measure the Low Energy Solar Neutrino Spectrum (pp,  ${}^7\text{Be}$ , and CNO)<sup>1</sup>** S. DEREK ROUNTREE, Virginia Tech, LENS COLLABORATION — LENS is a low energy solar neutrino spectrometer that will measure the solar neutrino spectrum above 115 keV, >95% of the solar neutrino flux, in real time. The fundamental neutrino reaction in LENS is charged-current based capture on  ${}^{115}\text{In}$  detected in a liquid scintillator medium. The reaction yields the prompt emission of an electron and the delayed emission of 2 gamma rays that serve as a time & space coincidence tag. Sufficient spatial resolution is used to exploit this signature and suppress background, particularly due to  ${}^{115}\text{In}$  beta decay. A novel design of optical segmentation (The Scintillation Lattice or SL) channels the signal light along the three primary axes. The channeling is achieved via total internal reflection by suitable low index gaps in the segmentation. The spatial resolution of a nuclear event is obtained digitally, much more precisely than possible by common time of flight methods. Advanced Geant4 analysis methods have been developed to suppress adequately the severe background due to  ${}^{115}\text{In}$  beta decay, achieving at the same time high detection efficiency.

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