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The Low Energy Neutrino Spectrometry (LENS) Experiment and LENS prototype, μLENS, initial results[1] ZACHARY YOKLEY, Virginia Tech, LENS COLLABORATION — LENS is a low energy solar neutrino detector 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-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-In beta decay. A novel design of optical segmentation (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-In beta decay, achieving at the same time high detection efficiency. LENS physics and detection methods along with initial results characterizing light transport in the as built μLENS prototype will be presented.

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