Abstract Submitted for the DNP12 Meeting of The American Physical Society

Low Radioactivity Film Light Guides for Large Neutrino **Detectors**¹ ZACHARY YOKLEY, Virginia Tech, THE LENS COLLABORATION — Light guides having ultra-low radioactivity, high-efficiency, and low cost are being developed to solve light collection in large neutrino experiments requiring extensive shielding between fiducial volumes and photomultiplier tubes (PMTs) and other external backgrounds. Such guides are particularly useful when segmentation of the detector is possible. The Low Energy Neutrino Spectrometer (LENS) detector uses an optically segmented 3D lattice that channels light via total internal reflection from an internal scintillation event down channels parallel to the 3 primary Cartesian axes to the edge of the detector. This unprecedented spatial resolution allows the LENS experiment to measure the solar neutrino spectrum above ~ 115 keV in the presence of its background In decay. Retaining the channel information prohibits use of traditional non-imaging light collectors. Thus, the LENS collaboration has developed guides made from multilayer films, providing both total internal and specular reflections. This talk will present the design and construction of these novel film guides in the context of LENS, and the construction of a 400 liter prototype miniLENS.

¹This research has been funded in part by the National Science Foundation on award numbers 1001394, 0812445, 0654212, 1001078.

Zachary Yokley Virginia Tech

Date submitted: 02 Jul 2012

Electronic form version 1.4