Abstract Submitted
for the DNP08 Meeting of
The American Physical Society

Measuring the low energy solar neutrino spectrum with the LENS experiment REX TAYLOE, Indiana University, LENS COLLABORATION — The Low-Energy Neutrino Spectroscopy (LENS) experiment is designed for a precision measurement in real time of the fluxes of low energy solar neutrinos (pp, ^{7}Be, pep, and CNO, comprising $> 99\%$ of the solar neutrino energy) via charged-current capture on Indium-115 (with threshold of 114 keV). LENS will allow a comparison of the neutrino and photon luminosities of the sun that will test the basic assumptions of solar astrophysics and the overall validity of the MSW-LMA neutrino model. The individual flux results will improve limits on θ_{12} and the pp spectrum can directly probe the temperature profile of fusion energy production. A detector technology, utilizing a novel optical segmentation method with indium-loaded liquid scintillator has been developed. A modest 1 m^3 prototype (miniLENS), in development for installation in the Kimballton Underground Research Facility (KURF), will demonstrate experimental feasibility and will allow for optimization for a 200 ton, full-scale LENS experiment.

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Date submitted: 01 Jul 2008 Electronic form version 1.4