Metal Loaded Organic Liquid Scintillator for the LENS Experiment

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LENS is a low energy neutrino experiment that will measure the solar neutrino spectrum above 114keV which accounts for >95% of the solar neutrino flux. It will allow us to measure the solar luminosity in neutrinos, test the current LMA-MSW oscillation model independently from solar models, probe the temperature profile of solar energy production, as well as search for sterile neutrino oscillations using an artificial neutrino source. The experimental tool is charged-current capture of the neutrino on In115, with prompt emission of an e- and delayed emission of 2 gamma rays that serve as a time/space coincidence tag. LENS requires ~10 tons of Indium be loaded into 100,000 liters of organic scintillator (pseudocumene, linear alkylbenzene) via liquid-liquid extraction. Results of several years of development will be described. The key properties of the Indium scintillator are: high metal loading (8-10%), long attenuation length at 430nm (>8m), high scintillation yield, stability on the scale of years.

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2Low Energy Neutrino Spectroscopy

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