

Abstract Submitted
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Low-Energy Solar Neutrino Detection Utilizing Advanced Germanium Detectors¹ SANJAY BHATTARAI, DONGMING MEI, MATHBAR RAUT, Univ of South Dakota — We prospect the possibility to use advanced germanium (Ge) detectors as a low-energy solar neutrino observatory by means of neutrino-nucleus elastic scattering. A Ge detector utilizing internal charge amplification for the charge carriers created by the ionization of impurities is a novel technology with experimental sensitivity for detecting low-energy solar neutrinos. Such a novel detector with only 1 kg of high-purity Ge will give ~ 10 events per year for pp neutrinos and ~ 4 events per year for ^7Be neutrinos with the energy threshold at 0.01 eV. We present the sensitivity of a Ge experiment for detecting solar neutrinos in the low-energy region. We show that, if germanium internal charge amplification technology becomes available, then a new opportunity arises to observe pp and ^7Be solar neutrinos. With 1 kg-year exposure, the sensitivity is equivalent to a xenon-based experiment with a detection threshold of 50 keV.

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