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New Prospects and Improvements in the Analysis for Low Energy Neutrinos in LENA

As a concept of a next generation large liquid scintillator detector LENA (Low Energy Neutrino Astronomy) has been proposed with a mass of 50 kt. The low energy threshold and large target mass of such a detector allow for a high statistic measurement of low energy neutrinos from astrophysical and terrestrial sources. An update on the analyses is presented showing among others the potential of determining the neutrino mass hierarchy using supernova neutrinos and the capability to establish a neutrino mass limit from such a neutrino burst. LENA offers the opportunity of a first time detection of the diffuse supernova neutrino background and we present an improved analysis covering the atmospheric NC background. The capability of a high statistic measurement of the B8 solar neutrino flux offers the potential to investigate the vacuum-matter transition region of the MSW effect.

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