Muons veto efficiency of the BOREXINO detector — Timo Lewke for the BOREXINO-Collaboration — Physik-Department E15, Technische Universität München, James-Franck-Straße, 85748 Garching.

Borexino is an organic liquid-scintillator detector for the measurement of the low-energy part of the solar neutrino spectrum. It consists of a 3001 PC (Pseudocumene) inner detector surrounded by approximately 1 kT of non-scintillating buffer liquid. As outer shielding, a water-filled tank is used. It also serves as a water Cherenkov muon veto.

In order to distinguish between neutrino events and cosmogenic background, muons have to be identified. Both outer and inner detector can be used to tag atmospheric muons. In this talk, different possibilities for muon identification in Borexino are explained. Moreover, the overall efficiency of the veto is presented.


The proposed project LENA (Low Energy Neutrino Astrometry) comprises a 50 kT liquid-scintillator multipurpose detector. Thanks to a low energy threshold, high energy resolution, and a large detector volume, LENA could offer the possibility to answer numerous physics questions. The goals of LENA extend to the fields of astrophysics (e.g. the observation of supernova, diffuse supernova and solar neutrinos), particle physics (search for proton decay), and geophysics (geoneutrinos). An overview of the potential of LENA is given in this talk, along with an introduction to scintillator physics and detector simulation.

LENA is a part of the European LAGUNA (Large Apparatus for Grand Unification and Neutrino Physics) collaboration that has been founded in order to study the feasibility of large-scale detectors with a common physics program. Apart from the liquid-scintillator detector LENA, it involves a 0.5 Mt water Cherenkov detector (MEMPHYS) and a 100 kT liquid Argon time projection chamber (GLACIER).

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RESULTS OF THE ELECTROMAGNETIC MESUREMENTS WITH THE KATRIN PRE-SPECTROMETER — Florian Habermehl for the KATRIN-Collaboration — Institut für Experimentelle Kernphysik, Universität Karlsruhe.

The KATRIN pre-spectrometer is a MAC-E filter (electrostatic spectrometer with magnetic adiabatic collimation), with the purpose of reducing the background in the KATRIN neutrino mass experiment. Various investigations conducted in winter 2006-2007 showed the presence of strong Penning discharges, exhibiting increase of pressure inside of the pre-spectrometer and of power supply leakage current, even for rather small tank potential and magnetic field. Calculations showed the presence of deep Penning traps at the two end-regions of the pre-spectrometer, close to the ground electrodes. Experiments indicated a clear correlation between the deepness of the Penning traps and the strength of the discharge; using electrode configurations without Penning traps no discharge was observed. In order to get rid of the deep Penning traps, new shielding electrodes were designed, constructed and installed into the spectrometer. According to the recent experiments, the presence of these electrodes completely solved the Penning discharge problem. The experiences obtained with the pre-spectrometer are very important in order to avoid Penning discharges inside the KATRIN main spectrometer and at the detector system.