could be used to discriminate and shield neutrons and muons. Moreover, an active veto surrounding every detector module is considered.

This work has been supported by funds of the DFG (Transregio 27: Neutrinos and Beyond), the Excellence Cluster Universe and the Maier-Leibnitz-Laboratorium (Garching).

T 104: Niederenergie-Neutrinophysik & Suche nach dunkler Materie 5

Zeit: Freitag 14:00–16:05 Raum: A140

Gruppenbericht T 104.1 Fr 14:00 A140

Recent Results from the BOREXINO Experiment — •Michael Wurm — for the BOREXINO Collaboration. Technische Universität München, Physik Department, E15 Lehrstuhl für Astroteilchenphysik; James-Franck-Str., 85748 Garching

The BOREXINO experiment aims at the detection of low-energetic solar neutrinos. 300 tons of organic liquid scintillator serve as target for neutrino-electron recoils that can be detected down to a threshold of several 100 keV. The necessary ultra-low background conditions have been achieved by multilayer shielding, use of radiopure materials, and purification of the target liquid. Data acquistion started in May 2007.

In this contribution, the most recent analysis of Berillium-7 neutrino events in BOREXINO is presented [PRL101:091302, 2008]. The first real-time measurement of Boron-8 neutrinos down to a threshold of 2.8 MeV is discussed. The comparison of the results of both measurements with the predictions of the Standard Solar Model confirms the MSW-LMA oscillation scenario at 1.8 sigma level [arXiv:0808.2868].

This work is partially funded by the Maier-Leibnitz-Laboratorium (Munich) and by the Excellenzcluster "Universe".

T 104.2 Fr 14:20 A140

11C Analysis and Muon Tracking in Borexino for solar pep and CNO neutrino spectroscopy — •Werner Maneschg — Max-Planck-Institut für Kernphysik, Saupfercheckweg 1, D-69117 Heidelberg, Germany

Borexino is an experiment for low-energy neutrino spectroscopy at the Gran Sasso underground laboratories. Since May 2007 Borexino is taking data. The achieved radiopurity and the statistics collected up to now allow to study the smaller solar neutrino fluxes from the pep fusion process and the CNO cycle. The main background source is 11C induced by the in-sito muon flux. In 95% of cases a neutron is released by the parent 12C. The 11C-candidates can be tagged on an event-by-event basis by looking at the following threefold coincidence: (1) the parent muon, (2) the 2.2MeV gamma-ray from neutron capture on proton and (3) the decay of 11C. The method is discussed including the tagging of 11C and the muon track reconstruction. The strategy for the analysis of pep and CNO neutrinos is presented.

T 104.3 Fr 14:35 A140

Tagging of Cosmogenic Radionuclides and Muon-induced Neutrons in the solar Neutrino Experiment BOREXINO — •Quirin Meindl for the BOREXINO-Collaboration — Technische Universität München

The BOREXINO experiment is a 300t liquid-scintillator detector designed for the real-time detection of solar neutrinos in the sub-MeV energy range. Effort is currently directed to the determination of the solar neutrino fluxes from the pep fusion process, the three neutrino emissions of the CNO cycle as well as the low energy part of the ^{8}B branch. However, the detection of these neutrino branches is affected by radionuclides induced by the atmospheric muon flux at the site of the experiment. These muon-induced radionuclides form the so-called cosmogenic background. The production of cosmogenic radionuclides is accompanied by the coincidence of atmospheric muons and the neutrons they knock out from ^{12}C. This Three-Fold-Coincidence (TFC) of parent muon, knock-off neutron and generated radionuclide is the only known method to reject this cosmogenic background within the data. A high efficiency in the detection of these muons and their knock-off neutrons is therefore crucial for a successful measurement of the pep and CNO neutrino signal. The Talk will give an overview of the TFC technique and the current status of the BOREXINO detection capability of muon-induced neutrons.

This work is supported by funds of the Maier-Leibnitz-Laboratorium (Munich), and the excellence cluster "Universe".

T 104.4 Fr 14:50 A140

Entwicklung und Test von Ionenquellen für die Transportsektion des Neutrinomassenexperimentes KATRIN — •Marcel C.R. Zoll — Universität Karlsruhe (TH), Institut für Experimentelle Kernphysik

Das Experiment KATRIN am Forschungszentrum Karlsruhe zur Ruhemassenbestimmung des Neutrinos aus dem Elektronenspektrum des Betazerfalls von Tritium ist ein komplexes System aus verschiedenen Sektionen: Quelle, Transportstrecke, Spektrometer und Detektor. Jedes Segment muss darauf untersucht werden, ob die gestellten Anforderungen erfüllt werden. Gerade beim Abschnitt der Transport- und Pumpstrecke ist es wichtig den Einfluss von störenden Tritiumionen zu kennen, wie sie auch später im Experiment auftreten werden. Hierzu wird in drei Phasen das Konzept einer Ionenquelle entwickelt und realisiert. Mit dieser Ionenquelle kann am Bauteil direkt dessen Verhalten auf verschiedene Ionen unter laufzeitähnlichen Bedingungen nachgestellt und gemessen werden. Es werden vorgestellt: Der Aufbau und die Funktionsweise von KATRIN, besonders der Transportstrecke; die erste Proof-of-concept und die fertiggestellte (FT-ICR-)Test Ionenquelle der nächsten Generation, sowie die Anforderungen an die noch zu entwickelnde WGTS-Simulator Ionenquelle. Gefördert durch die DFG unter dem SFB TR27

T 104.5 Fr 15:05 A140

Tests with the second Differential Pumping Section for KATRIN — •Strahinja Lukic for the KATRIN-Collaboration — Universität Karlsruhe, Institut für Experimentelle Kernphysik

The KArlsruhe TRItium Neutrino experiment (KATRIN) aims at determining electron-neutrino mass from the beta-decay of tritium with unprecedented sensitivity of 0.2 eV/c^2. KATRIN comprises a Windowless Gaseous Tritium Source (WGTS), an electron-transport section, two high resolution electrostatic spectrometers and an electron detector. Along the electron-transport section, tritium will be pumped out for reprocessing and reinsertion into the source. Two stages of differential pumping followed by a cryogenic pumping system must reduce the tritium gas flow by a total factor of 10^{14} in order to avoid distortion of the electron energy spectrum and contamination of the spectrometers. In particular, the second Differential Pumping Section (DPS2-F) is constructed to reduce the flow of 10^{-2} mbar l/s at its input by at least a factor of 10^5. Beside that, DPS2-F will host devices for monitoring the concentration of ions produced in the WGTS and for their removal. In this talk a series of experiments will be described that aim at testing gas-flow reduction capabilities of the pumping section, as well as the performance of systems for ion-concentration measurement and for ion removal.

Supported by DFG in the framework of the SFB TR27.

T 104.6 Fr 15:20 A140

Calibration setup for testing vacuum-capabilities of the DPS2-F for KATRIN — •Aleksandra Gotsova for the KATRIN-Collaboration — Universität Karlsruhe (TH), Institut für Experimentelle Kernphysik

The Karlsruhe Tritium Neutrino experiment (KATRIN) aims to determine the neutrino mass from the tritium β-decay with 0.2eV sensitivity. The KATRIN setup consists of a tritium source, a transport system with differential (DPS) and a cryogenic pumping sections, a pre- and main spectrometer and a detector. The determination of the neutrino mass relies on the precise investigation of the high energy end of the tritium β spectrum using a high energy resolution electrostatic spectrometer with adiabatic magnetic collimation. The main objectives for the STS are: providing a windowless gaseous tritium source for the β-decay suppressing the tritium flow to the spectrometer by 14 orders of magnitude; preventing penetration of low energy ions to the spectrometer. The main differential pumping system (DPS2-F) consists of 5 beam tube sections separated by pumping chambers pumped by TMPs. Its tritium flow reduction factor (TRF) is expected to be 10e5. Inside the DPS2-F β-electrons are guided by SC solenoids with B =