HK 49: Poster – Astroteilchenphysik

Zeit: Donnerstag 14:00–16:00 Raum: P Foyer

HK 49.1 Do 14:00 P Foyer

Tests of High QE PMTs for the Water Cherenkov Muon Veto of XENON1T — •Daniel Pätzold, Serena Fattori, Cyril Grignon, and Uwe Oberlack for the XENON-Collaboration — Johannes Gutenberg Universität Mainz, Germany

The XENON Dark Matter program aims at directly detecting dark matter through the scattering of WIMPs off xenon nuclei. The detection principle is based on the concept of a dual phase xenon time projection chamber. The current experiment XENON100 is a leading dark matter experiment today, and its planned XENON1T successor aims at improving the sensitivity by another two orders of magnitude. A water cherenkov muon veto will be employed to achieve the required background suppression at the depth of the Gran Sasso National Laboratory (LNGS) in Italy. Here we discuss tests performed on high quantum efficiency 8 inch PMTs that will be used for the muon veto system.

HK 49.2 Do 14:00 P Foyer

Assembling and Improvement of a 2-phase Xe TPC for electron drift length measurements — •Sonja Esch, Ethan Brown, Volker Hannen, Christian Huhmann, Hans Kettling, Stephan Rosendahl, Johannes Schulz, and Christian Weinheimer — Institut für Kernphysik, Universität Münster

About 22 % of the universe consists of a new undetected form of matter called dark matter(DM). One highly theoretically motivated candidate for dark matter is the Weakly Interacting Massive Particle (WIMP) from super symmetry. The XENON program looks for these particles by nuclear recoils in liquid xenon in a 2-phase time projection chamber(TPC).

Particle interactions in liquid xenon produce scintillation and ionization. The ionization is drifted then converted to secondary scintillation signal and both are detected by photo multiplier tubes (pmts). Electronegative impurities inhibit the detection of these signals, and radioactive impurities can mimic a DM signal. A small TPC has been built in Münster and implemented in a cryogenic purification system.

The efficiency of purification is tested using γ-sources and measuring the resulting signals. The evolution of purity over time is analyzed. A characterization of the TPC is possible by introducing radioactive tracers to the liquid phase. For reduction of radioactive impurities a distillation column is planned. Its efficiency can be tested using the TPC. First results of the characterization of the TPC will be shown. This project is supported by DFG and the state NRW, contract number INST 211/528-1 FUGG and by BMBF under 05A11PM1 .