and have a better comparison with measured data.

HK 17.4 Mo 17:45 H-ZO 70

Probing light dark matter by e^-p scattering — •Tobias Beranek, Achim Denig, and Marc Vanderhaeghen — Institut für Kernphysik, Johannes-Gutenberg Universität, 55099 Mainz

Gamma radiation from the galactic center around 511 keV has been observed for more than thirty years. These data imply that the 511 keV emission line is caused by annihilating low-energy positrons. Recent measurements of SPI spectrometer at the INTEGRAL probe confirm this hypothesis. The number of positrons in the galactic center is not large enough to explain the γ ray intensity in a simple way. A possible explanantion of this observation assumes a new gauge boson U and scalar dark matter particles ϕ with mass of $10 - 100$ MeV. The U boson couples to the Standard model particles as well as to the light dark matter particles ϕ.
We analyse the process $e^-p \to e^-pU$ as a background process to elastic scattering $e^-p \to e^-p$ and make a feasibility study for an experimental realization at the MAMI accelerator facility at Mainz. Simulations for the parameter space resulting from various theoretical approaches to light dark matter will be shown.

HK 17.5 Mo 18:00 H-ZO 70

Status and results from the EDELWEISS-2 Dark Matter Search — •Valentin Kozlov for the EDELWEISS-Collaboration — Forschungszentrum Karlsruhe, Institut für Kernphysik

EDELWEISS uses cryogenic Germanium bolometers to search for Dark Matter in form of weakly interacting massive particles, WIMPs. The experiment is situated in the French-Italian Fréjus tunnel, in the Modane underground laboratory LSM with a shielding of 4800 m.w.e against cosmic rays. Since the end of 2007, EDELWEISS is taking data, with a successive increase of target mass and further developments of detector technology.

We will present the status and the latest results of the current data taking with emphasis on the performance of new detectors. These detectors show a significantly improved β/γ-rejection and provide a promising base for a dark matter experiment of the next generation. In addition, the identification of muon-induced background events and special measurements of muon-induced neutrons will be discussed.

This work is supported in part by the German Research Foundation (DFG) through its collaborative research center SFB-TR27 ("Neutrinos and Beyond").

Group Report HK 17.6 Mo 18:15 H-ZO 70

Messung von Radioemission in ausgedehnten Luftschauern mit dem LOPES Experiment — •Jörg R. Hörandel und LOPES Kollaboration — Radboud University Nijmegen, Department of Astrophysics, Nijmegen, The Netherlands

Luftschauer entstehen durch die Wechselwirkung hochenergetischer Teilchen der kosmischen Strahlung in der Atmosphäre. Sekundäre Elektronen (und Positronen) werden im Erdmagnetfeld abgelenkt und emittieren Synchrotronstrahlung. Diese wird mit dem LOPES (LOfar PrototypE Station) Experiment im Frequenzbereich von 40 bis 80 MHz in zwei Polarisationsrichtungen (Nord-Süd und Ost-West) mit einem Dipolantennenfeld registriert. Gleichzeitig werden die Eigenschaften der Luftschauer mit dem KASCADE-Grande Experiment vermessen. Die Intensität der registrierten Radiostrahlung wird als Funktion verschiedener Schauerparameter untersucht, dies sind u.a. Schauerenergie, Abstand zur Schauerachse und Winkel zwischen Erdmagnetfeld und Schauerachse. Neueste Ergebnisse werden präsentiert. Diese zeigen, daß die Messung von Radiostrahlung in Luftschauern auf dem Wege ist, sich als neue Methode zur Messung der Eigenschaften hochenergetischer ($> 10^{16}$ eV) kosmischer Strahlung zu etablieren.

HK 17.7 Mo 18:45 H-ZO 70

The GSI Anomaly — •Hendrik Kienert — Max Planck Institut für Kernphysik, Heidelberg

Recently, an interesting experiment at the ESR facility of GSI Darmstadt has observed a non-exponential decay law for electron capture decays of certain heavy nuclei. Several controversial attempts have been made to explain this effect in terms of neutrino mixing. We briefly describe the experimental results, give an overview of the literature, and show that the effect cannot be due to neutrino mixing. We also briefly discuss alternative explanation attempts and their problems.

HK 18: Accelerators and Instrumentation I

Time: Monday 16:30–19:00 Location: H-ZO 80

HK 18.1 Mo 16:30 H-ZO 80

Beam identification system of the COMPASS-Experiment — •Prometeusz Jasinski — Institut für Kernphysik, Universität Mainz, Johann-Joachim-Becherweg 45, 55099 Mainz

In order to study the production of exotic mesons the COMPASS experiment at CERN took data with a 190 GeV/c hadron beam in the year 2008. The negative hadron beam contains mainly of pions and a small fraction of about 3% of Kaons. To identify and trigger on the small Kaon component, two beam Cherenkov Detectors with Achromatic Ringfocus, so called CEDAR detectors were installed. In the talk I will present the detector performance of the CEDARs during the 2008 run, including their efficiency and the achieved purity of the Kaon signal. Prospects for the upcoming hadron run in 2009 will also be discussed. Supported by BMBF under the contract 06MZ224

HK 18.2 Mo 16:45 H-ZO 80

A Disc DIRC for PID for the PANDA Experiment at FAIR/GSI — •Tibor Keri for the PANDA-Collaboration — Physics Department, Glasgow, UK

Proton-antiproton annihilation is a unique tool to address fundamental questions of the strong interaction and to explore the structure of the nucleon. The PANDA collaboration proposes to build a state-of-the-art universal detector system to study reactions of anti-protons impinging on a proton or nuclear target internal to the high energy storage ring HESR at the planned FAIR facility at GSI, Darmstadt, Germany. Superior particle identification of charged and neutral particles is mandatory to fulfil PANDA's physics aims. Detectors for particle identification comprise energy measurements in tracking detectors, precision Time-Of-Flight detectors, electromagnetic calorimeters, muon chambers and Cherenkov detectors based on the focussing DIRC principle or on the time-of-propagation principle. The central detector will feature a barrel DIRC covering the central region and a novel disc DIRC providing particle identification apabilities in the forward region. Both DIRC systems will benefit from recent advances in detector technology aiming for a 3D DIRC design. The technical design and the current status of the development for the disc DIRC detector will be presented.

HK 18.3 Mo 17:00 H-ZO 80

The Disc DIRC Cherenkov Detektor at PANDA — •Benno Kröck, Avetik Hayrapetyan, Irina Brodski, Klaus Föhl, Marko Zühlsdorf, Michael Düren, Michael Sporleder, Oliver Merle, Peter Koch, and Peter Schönmeier — II. Physikalisches Institut, Universität Gießen, Gießen, Germany

In the PANDA experiment at FAIR a disc DIRC will provide particle identification in the forward region to cover polar angles between 5 and 22°. Two designs exist. One concept uses two space coordinates to measure the Cherenkov angle while the second one uses one space coordinate and the time of propagation (ToP) of the Cherenkov photons. The ToP design requires fast photon detectors on the ≈ 40 ps level. Dispersion causes different propagation times for different wavelengths and has to be considered. Dichroic mirrors are used to reduce dispersion effects by splitting the Cherenkov spektrum into two or more ranges. The performance of the new detector concept has been evaluated by Monte Carlo simulations and reconstruction studies.

HK 18.4 Mo 17:15 H-ZO 80

Multianoden-Microchannelplate-Photomultiplier für den PANDA-DIRC — •Alexander Britting, Wolfgang Eyrich, Albert Lehmann, Andreas Teufel und Fred Uhlig für die PANDA-Kollaboration — Physikalisches Institut IV, Universität Erlangen-Nürnberg

Für den geplanten PANDA-Detektor des neuen FAIR-Komplexes an der GSI in Darmstadt soll die Teilchenidentifikation von Pionen und