

T 508 Kosmische Strahlung X

Zeit: Donnerstag 16:20–18:50

Raum: HG2-HS1

T 508.1 Do 16:20 HG2-HS1

Der hypothetische Anteil von Annihilationsstrahlung dunkler Materie am hochenergetischen γ -Signal aus der Richtung des galaktischen Zentrums — ●JOACHIM RIPKEN für die H.E.S.S.-Kollaboration — Institut für Experimentalphysik, Universität Hamburg, Luruper Chaussee 149, 22761 Hamburg

In den letzten Jahren wurde von verschiedenen Experimenten TeV- γ -Strahlung aus der Richtung des galaktischen Zentrums beobachtet; so wurde vom H.E.S.S. Experiment in Namibia mit sehr guter Orts- und Energieauflösung ein Energiespektrum im Bereich von 100 GeV bis 10 TeV gemessen. H.E.S.S. ist ein Experiment der neuen Generation zur GeV/TeV- γ -Astronomie mit Cherenkovteleskopen in stereoskopischer Beobachtung. Durch die Annihilation von hypothetischen Teilchen der dunklen Materie (WIMPs) kann hochenergetische γ -Strahlung aus Bereichen erwartet werden, in denen eine erhöhte Dichte an dunkler Materie vermutet wird, wie z.B. dem galaktischen Zentrum. Es werden die neuesten Ergebnisse vorgestellt, die aus den H.E.S.S.-Daten des galaktischen Zentrums der Jahre 2003 und 2004 abgeleitet werden können.

T 508.2 Do 16:35 HG2-HS1

From the Scattering Spectrum of Dark Matter Direct Detection to Velocity Distribution Function of WIMPs — ●CHUNG-LIN SHAN — Physikalisches Institut der Universität Bonn, Nussallee 12, D-53115, Bonn

Weakly interacting massive particles (WIMPs) are one of the leading candidates for dark matter. Currently, the most promising method to detect many different WIMP candidates is the direct detection of the recoil energy deposited in a low-background laboratory detector due to elastic WIMP-nucleus scattering. So far the usual research has been to build some models of the Galactic halo and then predict the event rate of direct detection of WIMPs. The aim of our work is to invert this process. That is, we study what future direct detection experiment can teach us about the WIMP halo. As a first step we used time-averaged recoil spectra, assuming that no directional information exists. We develop a method to reconstruct the (time averaged) one-dimensional velocity distribution.

T 508.3 Do 16:50 HG2-HS1

Search for Dark Matter with AMS-02 — ●CHAN HOON CHUNG for the AMS collaboration — I. Physikalisches Institut B, RWTH-Aachen, D-52074, Aachen, Germany

The dark matter constitutes 85% of the matter density in the Universe and the investigation of its nature is one of the most important goals in astroparticle physics. The Alpha Magnetic Spectrometer(AMS-02) is a particle physics detector designed to measure charged cosmic rays spectra up to TV region on the International Space Station(ISS) for at least three years. The observation of cosmic positrons and antiprotons spectra offers an attractive way to search for supersymmetric dark matter candidates through annihilations in the galactic halo as well as study of galactic cosmic-ray propagation models. In this presentation, we would review the present situations and show the performance of AMS-02 detector for dark matter searches in space.

T 508.4 Do 17:05 HG2-HS1

CRESST Dark Matter search — ●EMILJA PANTIĆ for the CRESST collaboration — Max-Planck-Institut für Physik

CRESST is a cryogenic Dark Matter search experiment located at Gran Sasso underground laboratory. It is presently being upgraded for its second phase to run a modular detector with a total mass of 10 kg. The detector modules developed for CRESST-II consist of a 300 g CaWO_4 scintillating 'target' crystal and a smaller cryogenic light detector, both read out by tungsten superconducting phase transition thermometers. Combined phonon and light signals from such scintillating cryogenic detectors are used to suppress the non-nuclear recoil background. We present first significant limits on WIMP dark matter by the phonon-light technique from data collected with two prototype modules in a short run with a net exposure of 20.5 kg days.

T 508.5 Do 17:20 HG2-HS1

EURECA: The Future of Cryogenic Dark Matter Search in Europe — ●WOLFGANG RAU for the EURECA collaboration — Physik-Department E15, Technische Universität München, James-Franck-Str., 85748 Garching

Strong observational evidence points towards the existence of large amounts of a so far unknown type of non-baryonic matter, not accessible to direct astronomical observations (hence called Dark Matter), which dominates the matter content in the Universe. Supersymmetric extensions of the Standard Model of Particle Physics predict the existence of Weakly Interacting Massive Particles (WIMPs). These particles are among the best motivated candidates to solve the Dark Matter problem.

Many experiments started to directly search for WIMPs via a possible interaction with nuclei. Cryogenic detectors, measuring the energy deposition via a thermal signal and discriminating ionizing background events via a second, scintillation or ionization signal provide presently the best sensitivity, just entering the parameter range of interest for supersymmetric WIMPs. EURECA is a new project, based on the WIMP search experiments CRESST and EDELWEISS, aiming for a ~ 1 ton cryogenic detector. This large mass is necessary to fully explore the most interesting parameter region predicted by supersymmetry.

T 508.6 Do 17:35 HG2-HS1

Erste Messungen mit dem EDELWEISS-II Myon-Veto-Zählersystem — ●MARKUS HORN¹, JOHANNES BLÜMER^{1,2}, KLAUS EITEL¹ und ASTRID CHANTELAUZE¹ für die EDELWEISS-Kollaboration — ¹Forschungszentrum Karlsruhe, Institut für Kernphysik, Postfach 3640, 76021 Karlsruhe — ²Universität Karlsruhe(TH), Institut für Experimentelle Kernphysik, Gaedestr. 1, 76128 Karlsruhe

EDELWEISS ist ein aus kryogenen Germanium-Halbleiterdetektoren aufgebautes Experiment zum direkten Nachweis schwach wechselwirkender massiver Teilchen (WIMPs), das sich im Fréjus-Untergundlabor in Frankreich mit einer Abschirmung von 4800m.w.e. befindet. Nach Aufbau der zweiten Ausbaustufe in 2005 wird zunächst mit 28 Bolometern à 320g Detektormasse gemessen. Ein neues Myon-Veto-Zählersystem aus 42 Szintillatormodulen mit einer Fläche von 100m² ist in einem nahezu hermetischen Kubus um die Bolometer angeordnet. Monte Carlo Simulationen mit dem Programmpaket *Geant4* sollen die von hochenergetischen Myonen induzierte Neutronenproduktion innerhalb einer kompletten dreidimensionalen Detektorgeometrie beschreiben. Ergebnisse der Simulationen und erste Messdaten von kosmischen Myonen sowie der Status der Bolometer-Messungen werden vorgestellt und diskutiert.

T 508.7 Do 17:50 HG2-HS1

Investigation of optical scintillation properties for LENA and the detection of supernovae relic neutrinos — ●MICHAEL WURM¹, FRANZ VON FEILITZSCH¹, MARIANNE GOEGER-NEFF¹, KATHRIN HOCHMUTH², TERESA MARRODAN UNDAGOITIA¹, LOTHAR OBERAUER¹, and WALTER POTZEL¹ — ¹Physik-Department E15, Technische Universität München, James-Franck-Str. 85748 Garching bei München — ²Max Planck Institut für Physik, Föhringer Ring, München

The LENA (Low Energy Neutrino Astronomy) detector is proposed to be a large-volume liquid-scintillator device. The liquid scintillator suggested is about 50kt of PXE. The optical properties of scintillator cocktails based on PXE have been investigated. In addition, the potential of LENA in the detection of supernovae relic neutrinos has been studied. The background due to reactor neutrinos was calculated for different locations of the detector. With LENA the star formation rate can be determined up to a redshift $Z \sim 1$. Different models of gravitational collapse can be distinguished with this measurement.

T 508.8 Do 18:05 HG2-HS1

Potential of the large liquid-scintillation detector LENA in particle and astrophysics — ●TERESA MARRODAN UNDAGOITIA¹, FRANZ VON FEILITZSCH¹, MARIANNE GOEGER-NEFF¹, KATHRIN HOCHMUTH², LOTHAR OBERAUER¹, WALTER POTZEL¹, and MICHAEL WURM¹ — ¹Physik-Department E15, Technische Universität München, James-Franck-Str. 85748 Garching bei München — ²Max Planck Institut für Physik, Föhringer Ring, München

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