T 74: Gammaastronomie III

Zeit: Mittwoch 16:45–19:00 Raum: KGII-HS 2006

T 74.1 Mi 16:45 KGII-HS 2006

Atmospheric monitoring for the MAGIC telescope — •Jürgen Hose, Martin Fuchs, and Razmik Mirzoyan for the MAGIC-Collaboration — MPI for physics, Munich, Germany

Observation of Cherenkov-radiation from particle showers induced by high energy (GeV-TeV) cosmic rays in the high atmospheric layers is influenced by several physical parameters of the atmosphere. This is important for ground-based VHE gamma ray telescopes. Currently we're building a new improved micro-Lidar operating at 532 nm for monitoring the sky transparency. The system will be technical described and first measurements shown. Also we're using a pyrometer (cloud monitor) to detect clouds in the FOV of the MAGIC telescopes. Some results will be shown.

T 74.2 Mi 17:00 KGII-HS 2006

Twilight Observations with the MAGIC telescope — •Karsten Berger[1], Ching-Cheng Hsu[2], and Daniel Kranich[3] for the MAGIC-Collaboration — [1]Lehrstuhl für Astronomie, Universität Würzburg — [2]Max-Planck-Institut für Physik (Werner-Heisenberg-Institut) — [3]Institut für Teilchenphysik, Eidgenössische Technische Hochschule (ETH) Zürich

The MAGIC telescope has successfully observed several sources during strong moonlight, significantly extending the duty cycle of the telescope. Recently, we have started observations during astronomical twilight, which is a novelty in the field of Imaging Air Cherenkov Telescopes. In this talk, we will present first results of this campaign.

T 74.3 Mi 17:15 KGII-HS 2006

An analog sum trigger for Cherenkov Telescopes for low energy thresholds: Concept and realization — •Thomas Schweizer[1], Adam Nepomuk Otte[2], Michael Rissi[3], Maxim Shayduk[2], Eckart Lorenz[1], Razmik Mirzoyan[1], and Masahiro Teshima[1] for the MAGIC-Collaboration — [1]Max Plank institute, Muenchen — [2]Humboldt Universitaet, Berlin — [3]ETH Zurich

A new analog trigger concept which allows to reduce significantly the energy threshold of Cherenkov telescopes has been designed and implemented for the MAGIC telescope. The analog signals of a patch in the camera consisting of 10-18 pixels are summed up in an analog way. In order to prevent triggers from PMT-afterpulses and noise the signals are clipped at a certain amplitude. The average cosmic ray induced signals of MAGIC are 2.6ns FWHM. This allows us to keep the coincidence time window very short and strongly suppress accidental triggers from night sky background (NSB). Also, unlike the usual digital trigger designs, all low photon signals in the given patch in the camera are summed up and contribute into the trigger. As a result one can significantly lower the threshold setting. This trigger concept provides a low cost trigger installation and very effective and stable trigger for Cherenkov telescopes.

T 74.4 Mi 17:30 KGII-HS 2006

Automation of the Monte Carlo production for MAGIC — •Daniel Höhne, Thomas Bretz, and Daniela Dorner for the MAGIC-Collaboration — Lehrstuhl für Astronomie, Universität Würzburg

For the analysis of data taken with the MAGIC telescope MC simulations are indispensable. Different observational as well as technical conditions during data taking demand MC simulations accounting for these conditions. The goal of this work is an automated production of MC simulations. For this a MC database is interacting with the required MC production programs. A web interface will allow the user to select the MC simulations appropriate to an analysis task. The current status of the project will be presented.

T 74.5 Mi 17:45 KGII-HS 2006

High-reflective dielectric foil development with the low UV-cutoff for the light concentrators of the MAGIC-II telescope camera. — •Maxim Shayduk[1], Eckart Lorenz[2], and Thomas Schweizer[2] for the MAGIC-Collaboration — [1]Humboldt-Universitaet, Berlin — [2]Max Planck Institute, Muenchen

The light collectors such as Winston Cones are widely used in ground-based gamma-ray astronomy. The highest possible light collection efficiency and low UV-cutoff of the reflective surface are required for the collection of the Cherenkov light. The usage of dielectric materials allows one to reduce absorption and reach almost 100% reflectivity.

Here we will report about a high-reflective multilayer dielectric foil development with the low UV-cutoff. Developments were done in the collaboration with Fraunhofer-Institut fuer Elektronenstrahl-und Plasmatechnik, Dresden.

T 74.6 Mi 18:00 KGII-HS 2006

Monte Carlo Studies for the MAGIC-II Telescope System — •Pratik Majumdar and Emiliano Carmona — Max Planck Institute fur Physik, Muenchen

Within the year 2008, MAGIC will be upgraded to a two telescope system at La Palma. Its main goal is to improve the sensitivity in the stereoscopic operational mode. At the same time it will lower the analysis threshold of the currently running single MAGIC telescope. Performance studies of this system from the Monte Carlo simulations show an improvement in sensitivity by a factor 2-3 over a single telescope with marked improvements in both angular and energy resolution. Preliminary results from this study will be discussed.

T 74.7 Mi 18:15 KGII-HS 2006

Methode zur Korrektur des Einflusses von Calima auf Daten von Cherenkov Teleskopen — •Daniela Dorner[1], Thomas Bretz[1] und Kari Nilsson[2] — [1]Universität Würzburg, Würzburg, Deutschland — [2]Tuorla Observatory, Turku, Finnland

Calima, eine Schicht aus warmer Luft aus der Sahara, die sich von Nordafrika aus über dem Nordatlantik ausbreitet, verursacht starke Absorption in den unteren Luftschichten. Da die Erdatmophäre besonders in der Cherenkov Astronomie eine grosse Rolle spielt, muss der Effekt von Calima auf die Daten in der Analyse untersucht und berücksichtigt werden. Um die Ergebnisse von solchen Daten für physikalische Interpretationen verwenden zu können, muss eine Korrektur angewandt werden.

Auf La Palma, wo sich das MAGIC Teleskop befindet, stehen drei verschiedene Messungen der atmopsphärischen Absorption zu Verfügung. Da die Ergebnisse dieser Messungen gut übereinstimmen, wurde daraus eine Korrektur errechnet, die auf die betroffenen Cherenkov Daten angewandt wird. Auf diese Weise konnten zum Beispiel die Daten von PG 1553+113 aus einer Multiwellenlängen-Kampagne korrigiert und die Ergebnisse für Multiwellenlängen-Studien verwendet werden.

T 74.8 Mi 18:30 KGII-HS 2006

Sensitivitätsverbesserung bei MAGIC durch Berücksichtigung der Signalankunftszeit in der Analyse — •Thomas Bretz für die MAGIC-Kollaboration — Universität Würzburg, Deutschland

Bei abbildenden Luft-Cherenkov Teleskopen wird das Licht atmosphärischer Schauer in einer pixelierten Kamera detektiert. Die Morphologie der gemessenen Lichtverteilung wird in der Analyse verwendet um Untergrundereignisse, z.B. protoninduzierte Schauer, zu unterdrücken. Wird neben der Lichtintensität auch die Ankuftszeit des Signals gemessen, Kann mit dieser zusätzlichen Information eine verbesserte Untergrundunterdrückung erzielt werden. Für MAGIC wird durch diese Methode eine Sensitivität von 1.5% Crab für fünf Sigma in 50 h erreicht. Eine Studie zur Sensitivitätsverbesserung durch Verwendung der Ankunftszeit in der Analyse sowie ein Vergleich von 300 MHz und 2 GHz Abtastrate werden präsentiert.

T 74.9 Mi 18:45 KGII-HS 2006

Gamma-Hadron Separation with TMVA — •Stefan Ohm for the H.E.S.S.-Collaboration — Max-Planck-Institut für Kernphysik, 69029 Heidelberg

H.E.S.S. is a system of four imaging atmospheric Čerenkov telescopes, operating in the Khomas Highland in Namibia. It explores the origin of Galactic cosmic rays by means of gamma-rays in the energy range from 100 GeV to 100 TeV. One main difficulty in the analysis is the suppression of the vast number of cosmic-ray background events, whilst keeping a large fraction of the gamma-rays.
A new set of parameters designed to increase the separation power between signal and background is combined with variables used in the H.E.S.S. standard analysis in a multidimensional classification algorithm. Tests of this so-called Boosted Decision Tree with Monte Carlo

simulations and real data are presented.