T 93: Gammaastronomie II

Zeit: Dienstag 16:45–19:05 Raum: HG XVII

Gruppenbericht T 93.1 Di 16:45 HG XVII

Status of the MAGIC telescopes — •Pierre Colin, Emiliano Carmona, Thomas Schweizer, and Julian Sitarek for the MAGIC-Collaboration — Max-Planck-Institut fuer Physik, Werner-Heisenberg Institut, Foehringer Ring 6, 80805 Muenchen, Germany

MAGIC is a system of two 17-m Cherenkov telescopes located on La Palma (Canary islands),sensitive to gamma-rays above 30 GeV. It has been recently upgraded by a second telescope which strongly improves the sensitivity, particularly at low energy. Here we present the status of the MAGIC telescopes and an overview of the recent results obtained in single or stereoscopic mode. We also discuss the real performance of the new stereoscopic system based on Crab Nebula observations.

T 93.2 Di 17:05 HG XVII

Modeling the very high energy emission of Supernova remnants — •Iurii Sushch — Humboldt Universität

Supernova remnants (SNRs) are observed in all energy bands from the radio to the very high energy (VHE) TeV emission. The VHE emission can be modeled using existing radio and X-ray data of SNRs. The modeling of the VHE emission was done within an electronic scenario taking into account synchrotron emission of electrons and inverse Compton scattering on CMB photons. As a result of modeling the predicted VHE flux is calculated and its dependence on the magnetic field is shown.

T 93.3 Di 17:20 HG XVII

MAGIC observations of the Crab pulsar — •Takayuki Saito[1], Nepomuk Otte[2], Michael Rissi[3], Thomas Schweizer[1], and Maxim Shayduk[1] for the MAGIC-Collaboration — [1]Max-Planck-Institut fuer Physik, Muenchen, Germany — [2]Santa Cruz Institute for Particle Physics and Department of Physics, University of California, Santa Cruz, USA — [3]ETH, Zurich, Switzerland

MAGIC detected pulsed gamma-rays above 25 GeV from the Crab pulsar in winter 2007-2008 and follow-up observation was done in winter 2008-2009. Here we will present the datailed analysis results including phase resolved energy spectra, energy dependence of P1/P2 ratio and peak phases. These results will be compared with the Fermi-LAT results from 100 MeV to 20 GeV.

T 93.4 Di 17:35 HG XVII

Supernova Remnants in the Gamma-Ray Sky as seen with H.E.S.S. — •Anne Bochow, Andreas Förster, Christoph Deil, and Werner Hofmann for the H.E.S.S.-Collaboration — Max-Planck-Institut für Kernphysik, Heidelberg

Recent advances in the instrumentation to observe Very-High Energy (VHE) gamma rays have made the discovery of numerous sources possible. About 100 VHE gamma-ray sources are known at date, many of them discovered in the Galactic Plane survey of H.E.S.S., an array of imaging atmospheric Cherenkov telescopes in Namibia. Of these galactic H.E.S.S. sources, up to 15 show spatial coincidence with supernova remnants (SNRs). For a catalog of SNRs visible in Radio in the central Milky Way, we compare VHE gamma-ray flux predictions, based on SNR parameters, to H.E.S.S. measurements. In a statistical comparison we study how the probability to detect an SNR as VHE gamma-ray source with H.E.S.S. depends on its properties.

T 93.5 Di 17:50 HG XVII

Detection of VHE gamma-ray emission from the vicinity of PSR B1706-44 with H.E.S.S. — •Ryan C. G. Chaves[1], Emma de Oña Wilhelmi[1], Régis Terrier[2], Christian Stegmann[3], Bruno Khélifi[4], and Okkie C. de Jager[5] for the H.E.S.S.-Collaboration — [1]Max-Planck-Institut für Kernphysik, Saupfercheckweg 1, 69117 Heidelberg, Germany — [2]APC, CNRS, Univ. Paris 7 Denis Diderot, 10, rue Alice Domon et Leonie Duquet, F-75205 Paris Cedex 13, France — [3]Universität Erlangen-Nürnberg, Physikalisches Institut, Erwin-Rommel-Str. 1, D 91058 Erlangen, Germany — [4]LLR, Ecole Polytechnique, CNRS/IN2P3, F-91128 Palaiseau, France — [5]Unit for Space Physics, North-West Univ., Potchefstroom 2520, South Africa

The gamma-ray pulsar PSR B1706-44 and the adjacent supernova remnant (SNR) candidate G343.1-2.3 were observed by H.E.S.S. during a dedicated observational campaign in 2007. A new source of very-high-energy (VHE; E > 100 GeV) gamma-ray emission, HESS J1708-443, was discovered with its centroid at RA(J2000.0) = 17h8m10s and Dec(J2000.0) = -44d21' (± 3' statistical error on each axis). The VHE gamma-ray source is significantly more extended than the H.E.S.S. point-spread function and has an intrinsic Gaussian width of 0.29 deg ± 0.04 deg. Its energy spectrum can be described by a power law with a photon index = 2.0 ± 0.1 (stat) ± 0.2 (syst). The integral flux measured between 1 and 10 TeV is ∼17% of the Crab Nebula flux in the same energy range. The possible associations with the energetic PSR B1706-44, also recently detected in the GeV domain with Fermi/LAT and AGILE, and SNR G343.1-2.3 are discussed.

T 93.6 Di 18:05 HG XVII

Röntgenanalyse von Pulsarwindnebeln — •Markus Holler für die H.E.S.S.-Kollaboration — ECAP, Universität Erlangen-Nürnberg

Aktuelle abbildende Cherenkov-Teleskopsysteme, wie z.B. H.E.S.S., haben in den letzten Jahren nicht-thermische, hochenergetische Gammastrahlung mehrerer Pulsarwindnebel (PWN) entdeckt. Rückschlüsse auf die zugrundeliegende Population relativistischer Elektronen in PWN lassen sich durch die Beobachtung der Synchrotronstrahlung im Röntgenbereich ziehen. Mit Röntgensatelliten ist es möglich, ortsaufgelöste Spektroskopie zu betreiben. In diesem Vortrag präsentieren wir neueste Ergebnisse der Röntgenanalyse von ausgedehnten PWN und diskutieren die Implikationen für die Modellierung von VHE-γ-Strahlung.

T 93.7 Di 18:20 HG XVII

HESS J1356−645, a new γ-ray pulsar wind nebula? — •Manuel Paz Arribas for the H.E.S.S.-Collaboration — Humboldt University, Berlin, Germany — DESY, Zeuthen, Germany

HESS J1356−645 was recently discovered by the H.E.S.S. Cherenkov telescope system as a new γ-ray source above 100 GeV very close to the location of the young and energetic pulsar PSR J1357−6429. This source has been investigated based on observations of 10 hours livetime and preliminary results show a clear signal with a significance at the 8.5 σ level. The spectral analysis reveals a quite hard spectrum well described by a power law with a 2.2 photon index and an integrated flux between 1 and 10 TeV of about 11% of the Crab Nebula flux in the same energy band. The analysis of x-ray data and preliminary results of the γ-ray data give indications for a pulsar wind nebula scenario as a possible explanation for the γ-ray emission.

T 93.8 Di 18:35 HG XVII

Describing Pulsar Wind Nebulae with a simple leptonic model — •Joachim Hahn[1], Stefan Hoppe[1], Kathrin Egberts[2], Wilfried Domainko[1], and Werner Hofmann[1] for the H.E.S.S.-Collaboration — [1]Max-Planck-Institut für Kernphysik, Heidelberg — [2]Institut für Astro- und Teilchenphysik, Leopold-Franzens-Universität Innsbruck

In recent years, Cherenkov telescopes like e.g. H.E.S.S. have identified a large number of very-high-energy (VHE) gamma-ray sources as Pulsar wind nebulae (PWNe). The VHE-gamma-ray emission shows a rich diversity of spectral and spatial morphologies. Theoretical models can help to understand and interprete the observed source properties. A simple semi-analytical leptonic model describing VHE gamma-ray emission from PWNe will be presented. It assumes diffusion with radiative cooling as the transport mechanism for electrons and their interaction with radiative and interstellar magnetic fields as the origin of electromagnetic radiation. In the framework of this model, spectral and spatial properties of the expected VHE gamma-ray emission from single PWNe may be estimated.

T 93.9 Di 18:50 HG XVII

Neue Beobachtungen des Pulsarwindnebels MSH 15-52 mit H.E.S.S. — •Fabian Schöck für die H.E.S.S.-Kollaboration — ECAP, Universität Erlangen-Nürnberg

Pulsarwindnebel (PWN) emittieren nicht-thermische, hochenergetische Gammastrahlung im TeV-Bereich, die von abbildenden Cherenkovteleskopen wie dem H.E.S.S. Teleskopsystem gemessen werden kann. Mehr als zehn PWN wurden mit der derzeitigen Generation von Gammastrahlungsteleskopen bereits entdeckt. Der PWN MSH 15-52 war 2005 die erste ausgedehnte Quelle hochenergetischer Gammastrahlung die von H.E.S.S. detektiert wurde. Neue Analysemethoden und

ein vergrößerter Datensatz ermöglichen nun eine detaillierte Analyse. In diesem Vortrag werden neue Ergebnisse der spektralen Analyse von MSH 15-52 präsentiert. Des weiteren wird auf die Morphologie der Quelle eingegangen.