# T 104: Gammaastronomie V

Zeit: Donnerstag 16:45–18:00 Raum: VMP9 SR 27

T 104.1 Do 16:45 VMP9 SR 27

**The grid-scan: a novel method for a less biased broadband SED modeling** — •Marlene Doert[1] and David Paneque[2] — [1]Ruhr-Universität Bochum — [2]Max-Planck-Institut für Physik, München

We present a novel strategy for the modeling of blazar SEDs in the scope of current emission models: the grid-scan modeling. With an unbiased and uniform scan of the multi-dimensional parameter space of current emission models, e.g. the SSC model, and an a posteriori evaluation of the model-to-data agreement, independent sets of equally good model representations can be found. This variety of models generally includes different valid physical scenarios, which offer a more complete picture than single "best" solutions found by minimizers or the often-practised "eyeball-fit". Additionally, the grid-scan also allows to quantify how well the individual model parameters get constrained by any given experimental data set. The method will be introduced using the example of multi-wavelength spectral measurements of the blazar Markarian 501.

T 104.2 Do 17:00 VMP9 SR 27

**Search for high confidence AGN candidates and its counterparts in the *Fermi*-LAT unassociated sample using machine learning** — Sabrina Einecke[1] and •Marlene Doert[2] — [1]Technical University Dortmund, Germany — [2]Ruhr-University Bochum, Germany

The third *Fermi*-LAT source catalog (3FGL) is the deepest all-sky survey in gamma-rays and comprises 3033 point sources. While for 2023 sources plausible associations have been found, 1010 remain unassociated. A search for active galactic nuclei (AGN) will help to reduce the number of unassociated sources, and will increase our knowledge of the population of gamma-ray emitting AGN.

Several machine learning approaches applied to *Fermi* data have shown the capability of this method. The extension to multiwavelength data improves these studies, and at the same time offers the possibility to determine the most likely corresponding counterpart. As the 95% confidence region of the localization by the *Fermi* measurement is in the order of several arcminutes, generally multiple point sources at different wavelengths are located within this region and the association is ambigous. To figure out the most likely counterpart, the associated sample is used to train machine learning classifiers as e.g. the random forest. Therefore, all possible combinations of the *Fermi* measurement and the measurements at a second wavelength are considered for a particular source. In this talk, the statistical model to obtain high confidence AGN counterpart candidates will be described as well as the validation of the model to estimate the performance.

T 104.3 Do 17:15 VMP9 SR 27

**Implication of the detection of very hard spectra from the TeV blazar Mrk 501** — •Amit Shukla[1], Karl Mannheim[2], Varsha R. Chitnis[3], Jayashree Roy[4], Bannanje Sripathi Acharya[4], Daniela Dorner[2], Gareth Hughes[1], and Adrian Biland[1] — [1]ETH Zurich, Institute for Particle Physics, Otto-Stern-Weg 5, 8093 Zurich, — [2]Institute for Theoretical Physics and Astrophysics, Universität Würzburg, 97074 — [3]Department of High Energy Physics, Tata Institute of Fundamental Research, Mumbai — [4]Center for Excellence in Basic Sciences, UM-DAE Mumbai 400005, India

The emission from active galactic nuclei ranges from radio to TeV energies and shows high variability. The origin of the high energy emission is highly debated. The observed emission could be due to a complex superposition of emission from multiple zones. New evidence of the detection of very hard intrinsic gamma-ray spectra obtained from Fermi-LAT observations have challenged the theories about origin of VHE gamma-rays. We have used the 7 years of Fermi-LAT data to search for time intervals with unusually hard spectra from the nearby TeV blazar Mrk 501. In the presentation, we discuss a few possible explanations for the origin of these hard spectra within a leptonic scenario.

T 104.4 Do 17:30 VMP9 SR 27

**The long-term broadband monitoring of the high-peaked BL Lac Mrk 501 in 2014 including the most extreme X-ray flaring activity** — •Kazuma Ishio[1], Josepha Becerra Gonzalez[2], Koji Noda[1], David Paneque[1], and Fabrizio Tavecchio[3] for the MAGIC-Collaboration — [1]Max-Planck-Institut für Physik, München, Deutschland — [2]NASA Goddard Space Flight Center, Maryland, USA — [3]INAF Osservatorio Astronomico di Brera, Milan, Italien

Blazars emit over the entire electromagnetic spectrum and are variable on various timescales, from years down to minutes. Therefore, long and dense coverage over a wide energy range is needed for characterizing and unraveling the dynamics of blazars.

Markarian 501, a BL Lac type blazar object, located in our extragalactic neighborhood (z=0.034), is an ideal source, because of its proximity and high brightness, which allows significant detections in short observing times. I will report results from the campaign in 2014, including the very high activity in July 2014, during which the source displayed the highest X-ray fluxes detected in 10 years of operation with Swift, together with very hard spectra at X-rays and gamma-ray energies with substantial variability on day timescales.

T 104.5 Do 17:45 VMP9 SR 27

**Multi-TeV Gamma ray and cosmic ray astrophysics with TAIGA** — •Martin Tluczykont[1] and TAIGA Kollaboration[2] — [1]Institut für Experimentalphysik, Luruper Chaussee 149, 22761 Hamburg — [2]taiga-experiment.info

The very high energy gamma-ray regime is the key to several questions in high energy astrophysics, the most prominent being the search for the origin of cosmic rays. Observations of gamma rays up to several 100 TeV are particularly important to spectrally resolve the cutoff regime of the long-sought Pevatrons, the accelerators of PeV cosmic rays. TAIGA is an international collaboration that has, in the past 3 years, installed the air Cherenkov timing array HiSCORE on an area of 0.25 square-km, and are currently installing a first 4m diameter imaging air Cherenkov telescope (IACT), to be operated in parallel with the timing array. Our aim is to combine the timing and imaging techniques on a large scale in order to optimize the air Cherenkov detection technique for energies above 10 TeV and up to several 100 TeV. Simulations show a clear potential of the planned hybrid event reconstruction, especially in the energy regime from 10 TeV to 100 TeV. The TAIGA experiment will be complemented by scintillator based particle detectors for a measurement of the muon content of the air shower at higher energies. The status of our experiment and the planned 1 square-km stage of TAIGA will be disussed.