ICRC2015

ICRC
The Astroparticle Physics Conference
34th International Cosmic Ray Conference
July 30 - August 6, 2015
The Hague, The Netherlands

Contribution ID: **1011** Type: **Oral contribution**

A Neural Network-based Reconstruction Algorithm for monoscopically detected Air Showers observed with the H.E.S.S. Experiment

Monday, 3 August 2015 11:15 (15 minutes)

The H.E.S.S. experiment entered its second phase with the addition of a new, large telescope called CT5 that has been added to the centre of the existing array of four smaller telescopes. Because of its larger mirror area the new telescope is able to detect fainter air showers, thereby lowering the energy threshold of the array from O(100 GeV) down to a few tens of GeV. Due to the power law dropoff of typical gamma ray and cosmic ray spectra a majority of all detected air showers are of low energies, thus being detected by CT5 only, which motivates the need for a reconstruction algorithm based on information of CT5 alone. Exploiting such monoscopic events using a suitable reconstruction mechanism it will be possible to close the gap between spectra measured by Fermi-LAT and the H.E.S.S. experiment in its first phase. Also the chances of detecting transient events like gamma ray bursts are increased significantly due to the low energy threshold and large effective area of CT5.

In this talk a newly developed reconstruction algorithm for monoscopic events based on neural networks is presented. This algorithm uses MLP networks to reconstruct the shower direction, the energy of the particle initiating the air shower and to discriminate between gamma rays and hadrons. The performance of this algorithm is evaluated and compared to other existing reconstruction algorithms. Furthermore results of first applications of the algorithm to measured data are shown.

Collaboration

H.E.S.S.

Registration number following ”ICRC2015-I/”

848

Primary author: Mr MURACH, Thomas (Humboldt-Universität zu Berlin)

Co-authors: GAJDUS, Michael (Humboldt Universität zu Berlin); Dr PARSONS, Robert

Presenter: Mr MURACH, Thomas (Humboldt-Universität zu Berlin)

Session Classification: Parallel GA11 Instruments / Prospects

Track Classification: GA-IN