Contribution ID: **39** Type: **not specified**

Ground based detection of VHE and UHE cosmic rays: MAGIC, ARGO and AUGER

Wednesday, 27 April 2011 18:00 (20 minutes)

A major boost in the cosmic ray (CR) studies came in the last decades from the experimental effort to investigate the extreme energy region >1 EeV (UHE) of the CR spectrum and the nature of the astrophysical sources responsible for the CR acceleration.
The AUGER observatory provided a clear indication of the attenuation of the CR flux by the GZK effect and yielded puzzling results on the composition indicating a heavier component for increasing energy.
The higher statistics of events with E>60 EeV, only slightly deviated by the intergalactic magnetic field, allowed to study the anisotropy in the CR arrival direction, which seems to correlate with the distribution of matter in the nearby Universe. The nature of these sources is still debated, possibly being Active Galactic Nuclei, starburst galaxies, nearby radiogalaxies.
These objects are investigated in the Very-High Energy (VHE, E>100 GeV) region by ground based gamma-ray detectors.
Gamma-ray emission stems from interaction processes of the accelerated particles, leptons and hadrons, with the environment surrounding the acceleration site, thus providing direct information on the acceleration mechanism in astrophysical sources. Hadronic (i.e. CRs) acceleration sites are likely hosted in supernova remnants, but no clear evidence has been found for hadronic processes in extragalactic sources, that are assumed to produce the UHE CRs.
The gamma-ray detectors based on the air Cherenkov technique, like MAGIC, or on direct detection of the particles produced in the atmospheric air showers, like ARGO, succeeded to discover new sources and new populations emitting VHE gamma-rays. The VHE emission, often correlated with electromagnetic emission in other wavebands (from radio to X-rays) supplies the observational standpoint to disentangle the predicted leptonic emission from the long-seeked hint of CR acceleration.

Presenter: STAMERRA, Antonio (SI)

Session Classification: Fisica Astroparticellare - I

Track Classification: Fisica Astroparticellare