HEP 2013
Stockholm
18-24 July 2013

Contribution ID: **156** Type: **Poster Presentation**

Radio-detection of extensive air showers at the Pierre Auger Observatory - Results and next enhancements

The Pierre Auger collaboration is exploring the potential of radio-detection techniques to measure the extensive air showers induced by ultra-high energy cosmic rays. The main advantages of these setups are no atmospheric attenuation and the possibility to cover a large area with 100% duty cycle. Radio-emission in the MHz range is recorded by the Auger Engineering Radio Array (AERA), presently consisting of 24 stations distributed over an area of 0.5 kmˆ2 and growing in 2013 to 160 units over about 20 kmˆ2. This enhancement is focused on physics of cosmic rays with an energy greater than 10ˆ17 eV. On the other hand, novel detection techniques based on the GHz emission from extensive air showers are being tested at the Pierre Auger Observatory. Three different setups are currently installed and are collecting data: MIDAS (Microwave Detection of Air Showers) and AMBER (Air-shower Microwave Bremsstrahlung Experimental Radiometer) are prototypes of an imaging parabolic dish detector, while EASIER (Extensive Air Shower Identification using Electron Radiometer) records the radio-emission by antenna horns located on more than 60 surface detector units. The status of these different activities and the new results in MHz and GHz bands will be reported.

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Track Classification: Astroparticle Physics