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The EEE Project: an extended network of muon telescopes for the study of cosmic rays

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The EEE (Extreme Energy Event) Project is an experiment to study high energy extensive air showers (EAS) over a very large area, using an array of muon telescopes, based on position-sensitive Multigap Resistive Plate Chambers. Each telescope is composed by three MRPC, with an active area of 0.82 x 1.58 m². Each chamber is segmented into 24 strips, and a readout at the two ends. Strip size and measurement of the time difference at the two ends, provide an overall spatial resolution of about 7 mm along the two coordinates. A VME-based data acquisition include a trigger card, 144 TDC channels and a GPS unit for remote synchronization.

At present the array is composed of more than 40 stations, located in Italian high schools, INFN sections (total area 3 x 10⁵ km²) and at CERN, and most of them were independently taking data since several years. A new combined run (RUN 1) has started in February 2015, with more than 20 telescopes taking data simultaneously and a collected statistics larger than 5 x 10⁹ reconstructed events.

An overview of the experiment, experience on a several year running period and some results from physics analyses will be given. Studies on correlated muons from the same EAS in many metropolitan areas, for distances up to ~2 km, solar events and Forbush decreases observed at the same time by several stations, upgoing low energy tracks and angular distributions of the detected muons, also making use of equatorial coordinates, will be shown.

Collaboration

EEE Collaboration

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