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A cosmic muon test facility with the MRPC telescopes of the EEE Project

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Extreme Energy Events (EEE) detectors are designed to measure secondary cosmic ray tracks, mainly muons, to study high energy primary cosmic rays. The EEE 'telescope'is made by 3 Multigap Resistive Plate Chamber (MRPC), each with an active area of 160x82 cm2 in size. Each detector is part of a large network of about sixty telescope s spread over the Italian territory. GPS time synchronization of the telescopes allows the detection of extensive air showers produced by high energy primary cosmic ray interactions in the Earth atmosphere. Due to the good (o excellent) tracking capabilities (100 ps time resolution and cm2 spatial resolution) the EEE telescope can be used also as test station for large area detectors. The link between the EEE track and signals from the detector under test detector is obtained by implementing a streaming DAQ with a common time reference between the two systems given by the GPS signal. In this contribution I will present the installation and first results of the cosmic muon test facility with the MRPC telescopes based on the low-cost, streaming-compatible 12ch, 250MHz, 14 bits digitizer (INFN-WaveBoard or WB) developed by the JLAB12 Collaboration. According to the detector under examination, different measurements can be performed: in a scintillator crystal bars, for example, the efficiency and optical attenuation along the detector length can be easily tested. In a first test run, we characterized some scintillator crystal of PbWO4 from the POKER detector. The system can be easily replicated, instrumenting any EEE existing Telescopes , and providing a convenient cosmic ray test facility across Italy.

Collaboration

EEE Collaboration

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