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Multigap Resistive Plate Chambers for EAS study in the EEE Project

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The EEE (Extreme Energy Events) Project is an experiment to study very highenergy air showers through the detection of the muon component using a network of tracking detectors, installed inside Italian High Schools. The EEE project is supported by INFN, CERN, Ministero dell'Universit a e della Ricerca (MIUR), Centro Fermi and conceived by its leader Antonino Zichichi. The single tracking telescope is composed by 3 Multi-gap Resistive Plate Chambers (MRPCs), a large (2 m²) and cheap version of the detector designed for TOF measurements in the ALICE experiment at LHC. The multiple small gas gaps, combined with the use of a high gain (α large, λ small) and a fast gas mixture (Freon and SF₆ based), provide a time resolution < 100 ps. The particle tracking is performed equipping the MRPC with 24 copper strips read at both ends by front-end electronic cards based on the fast NINO Asic and using commercial multi-hit TDCs. The detectors are built at CERN by High Schools students and teachers, shipped to Italy, tested at INFN laboratories and finally installed in the schools. In the first phase of the project the telescopes will be installed in 21 High Schools in 7 cities all over Italy. The network will soon be heavily upgraded. The first telescope, recently installed in the Liceo B. Touschek in Grottaferrata (Rome), is successfully running, opening the way for the first search of far away coincidences over a total area of ~ 10 6km².

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