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Tragaldabas: a high performance detector for the regular study of cosmic ray properties

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Cosmic rays, coming either from the Sun, our galaxy or other galaxies, are permanently arriving to the Earth after having been affected by the intergalactic magnetic fields, the solar activity and the terrestrial atmosphere, being a very valuable source of information of our surrounding Universe.

Since the last year, a new RPC-based tracking detector, TRAGALDABAS (acronym of "TRAsGo for the AnaLysis of the nuclear matter Decay, the Atmosphere, the earth's B-field And the Solar activity"), has been installed at the Univ. of Santiago de Compostela, Spain (N:42°52'34",W:8°33'37") and is taking cosmic ray data at a rate of about 7 million of events per day. The detector has three active planes inside a volume of ~1.2x1.5x1.8 m^3 and offers a granularity of 120 cells per plane, an arrival time resolution of about ~300 ps, a tracking angular resolution below 3° and a detection efficiency close to one. A team of about 20 researchers from 11 laboratories of 5 European countries is collaborating in the maintenance and calibration of the detector and in the analysis of the data.

In this talk, the main design features of the facility will be presented together with their measured performances and a summary of the preliminary results obtained related with the main fields of research that are covered by the collaboration: analysis of the microstructure of cosmic ray showers, solar physics, space weather, geomagnetism and stratosphere dynamics, among others.

Collaboration

– not specified –

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