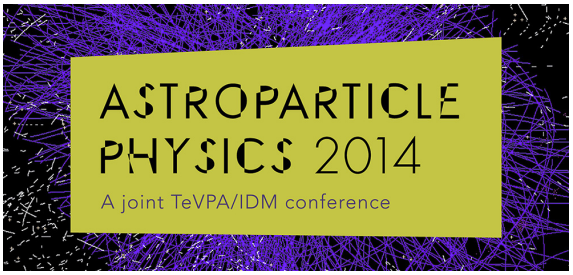

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Measurement of the Cosmic Ray energy spectrum by the ARGO-YBJ experiment

Monday, 23 June 2014 15:45 (15 minutes)

The ARGO-YBJ detector layout, features and location at high altitude (the Cosmic Ray Observatory of Yangbajing in Tibet, China, at about 606 g/cmˆ2 of atmospheric depth), joined to the analog readout of the RPC (Resistive Plate Chamber) streamer signals, provide the opportunity to study, with unprecedented resolution and without saturation, the distribution of the charged particles of extensive air showers (EAS) down to few meters from the axis, thus allowing to describe its shape in detail and to estimate the shower age at the detection level.
Exploiting such features, the study of cosmic ray physics in the primary energy region 10ˆ12 - 10ˆ16 eV has been performed, which is among the main scientific goals of the experiment. Here, the preliminary results of the measurement of all-particle and light-component (i.e. protons and helium) energy spectra between approximately 5 TeV and 5 PeV will be in particular reported and discussed.
The study of such energy region is particularly interesting because not only it allows a better understanding of the so called knee of the energy spectrum and of its origin, but also provides a powerful cross-check among very different experimental techniques. The comparison between direct measurements by balloon/space-borne spectrometers and the results by surface detectors, implying the knowledge of shower development in the atmosphere, also allows to test the hadronic interaction models currently used for understanding particle and cosmic ray physics up the highest energies.

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