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Hadronic interactions and Cosmic Ray mass composition studied by ARGO-YBJ

The ARGO-YBJ detector layout, features and location at high altitude (about 600 g/cm² of atmospheric depth) offer a unique chance for a detailed study of several characteristics of the hadronic component of the Cosmic Rays in the 10^{12} - 10^{15} eV energy range. Indeed, the analog readout of the RPC signals provides a powerful tool to study, with unprecedented resolution, 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.

These features make feasible, for the first time, mass composition studies with an EAS detector in an energy region where the comparison with direct measurements is now possible. Moreover, new inputs to the hadronic interaction models, currently used for the analysis of the cosmic ray flux and origin up to the highest energies, can be obtained.

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