

Gamma-ray astronomy and cosmic-ray physics with ARGO-YBJ

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The ARGO-YBJ detector, located 4300 m a.s.l. on the Tibet plateau, is a ground-based, full-coverage array of Resistive Plate Chambers (RPCs) covering a surface of $78 \times 74 \text{ m}^2$, surrounded by a guard ring of RPCs enclosing a total surface of about 11000 m^2 . ARGOYBJ was designed to detect extensive air showers generated by cosmic rays and gamma rays with primary energy greater than few hundred GeV, in order to study the region of the cosmic-ray spectrum out of the reach of both satellite-based experiments and traditional ground-based arrays. The experiment has been running with its complete layout since November 2007, collecting over 2.5×10^{11} events. The main results obtained by ARGO-YBJ will be presented here, and specifically:

- the monitoring of astronomical gamma-ray sources, such as the Crab nebula and the MRK 421 AGN;
- the moon shadow;
- the intermediate-scale and large-scale anisotropy map;
- the proton-proton inelastic cross section at center-of-mass energy between 70 and 500 GeV where no accelerator data are available.

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