

Observation of the Cosmic Ray Moon shadowing effect with the ARGO-YBJ experiment

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Cosmic rays are hampered by the Moon and a deficit in its direction is expected (the so-called 'Moon shadow'). The Moon shadow is an important tool to determine the performance of an air shower array. In fact, the displacement of the shadow center, due to the bending effect of the Geomagnetic field on the propagation of cosmic rays, allows to set the energy scale of the primary particles inducing the showers observed by the detector. The shape of the shadow permits to determine the detector point spread function. The position of the deficit at high energy allows evaluating its pointing accuracy. Here we present the observation of the cosmic ray Moon shadowing effect carried out by the ARGO-YBJ experiment (Yangbajing Cosmic Ray Laboratory, Tibet, P.R. China, 4300 m a.s.l., 606 g/cm²) in the multi-TeV energy region with high statistical significance (70 standard deviations). By means of an accurate Monte Carlo simulation of the cosmic rays propagation in the Earth-Moon system we have studied the role of the Geomagnetic field and of the detector point spread function on the observed shadow.

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