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Feasibility for p^+/p^- flow-ratio evaluation in the 0.5 - 1 TeV primary energy range, based on Moon-shadow muon measurements, to be carried out in the Pyramid of the Sun, Teotihuacan, Experiment.

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Abstract content

Several experimental works demonstrate the possibility of observation of shadows of the Moon and the Sun for the mean energy of primaries higher than 1 TeV. Calculations are presented to demonstrate the feasibility of Moon shadow observations for mean primary energies in the region 0.5-1 TeV in a muon detector operating under the Pyramid of the Sun at Teotihuacan, Mexico. Due to the relatively small height of that monument (65 m), the experiment is capable of providing considerably high statistics, but with deterioration in the angular accuracy for primary particle direction reconstruction. Our estimates are based on simulations of muon production and transport in the atmosphere by CORSICA, while the transport along the body of the pyramid is simulated using GEANT4. The deflection of primaries in magnetic field of the earth is calculated using the IGRF model. The analysis aims at discriminating between positively and negatively charged primaries traveling along directions corresponding to the Moon shadow region. The statistics for antiproton shadow observations, which depends on different factors affecting the accuracy of the primary particle direction reconstruction, is analyzed in detail.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 5 (HE part 2), pages 1543-1546

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