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Telescope Array Aperture: Mono, Stereo and Hybrid

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Abstract content

We have developed detector simulators for the TA fluorescence telescopes (FD) and the surface particle detector array. In this paper we describe a new method to evaluate the TA-FD aperture with a Monte-Carlo technique. Since the field of view and the effective area for the FDs are quite large, a considerable CPU cost is required for air shower simulations in the full observable region. In order to reduce CPU time, we employ an efficient simulation method for the aperture calculation. The basic assumption in this method is that each TA-FD station is comprised of 12 telescopes of identical characteristics. Therefore it is possible to calculate the triggering functions of a whole station for a given shower event by building up the single telescope triggering function with an appropriate superposition scheme. We have developed this method to calculate the FD aperture for various detector configurations, as monocular and stereo observations with a vetoed telescope, and hybrid observations with the surface detector array. We also discuss expected results and astrophysical significance from the TA first year observation.

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

The Telescope Array 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. 4 (HE part 1), pages 409-412

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