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Lateral Distribution of Energy Deposition and Initial Energy Spectrum above 1 PeV from IceTop

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Abstract content

With the present size of the IceTop air shower array it is possible to measure an energy spectrum in the range of 1 PeV to 100 PeV. To do so, a lateral pulse height fit was performed on all analysed showers. Therefore it is crucial to have a realistic parametrisation of the expected lateral distribution and the corresponding fluctuations of the measured tank signals. Since IceTop tanks do not measure particle numbers, but rather portions of deposited energy, the typically used lateral distribution functions like NKG do not apply. Hence, a suitable function was developed in a CORSIKA simulation study. Having two tanks separated by 10m at each detector station, it is furthermore possible to study local pulse height fluctuations directly in data. These are used to develop a parametrisation of the weights needed in the lateral fit procedure. We will present the results of these investigations and preliminary distributions of the resulting shower parameters.

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

IceCube

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olive, 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 35-38

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