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Stereo Reconstruction at HiRes

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Abstract content

We describe a technique used to reconstruct the energy and X_{\max} of Ultra High Energy Cosmic Rays (UHECR) observed by the HiRes detector in stereoscopic mode. This technique calculates the relationship between the number of shower particles at a given depth of the shower to the signal in either angular or time bins. This relationship is calculated for a given shower segment location. The estimated number of shower particles at a given shower depth is calculated using this relationship from the observed bin signals. The observed longitudinal shower profile is then fit using a technique developed by Martin Block which judiciously removes problematic data points. Estimated Energy Resolutions of approximately 12% or better are obtained with high efficiency for energies above $10^{18.5}$ eV for this technique. The estimated X_{\max} resolution for this technique is approximately 35 g/cm² or better for these energies.

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

HiRes

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 467-470

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