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Zenith angle dependence of the size spectrum of air showers around the knee observed with the Tibet air shower array

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Abstract content

The air shower size (Ne) spectrum of cosmic rays around the knee at different zenith angles has been studied with the Tibet-III air-shower array. The air shower size is estimated by fitting the lateral density distribution of the shower particles using the modified NKG function, which is optimized by the Monte Carlo simulation by using interaction models of QGSJET01c and SIBYLL2.1 taking into account of the detector configurations. It is shown that the model dependence in the air shower size determination is not significant being less than 10% in the absolute flux value and the location of the break Ne*(or ''knee") is seen to move to larger Ne* with increasing zenith angle. In this paper, we also show that for both models the observed air shower size spectra are wholly compatible with the heavy-enriched composition in the knee energy region.

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

Tibet ASgamma 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 99-102

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