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Study of the cosmic ray composition above 0.2 EeV using the longitudinal profiles of showers observed at the Pierre Auger Observatory

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Abstract content

The Pierre Auger Observatory has been collecting data in a stable manner since January 2004. We present here a study of the cosmic ray composition using events recorded in hybrid mode during the first three years of data taking. These are air showers observed by the fluorescence detector as well as the surface detector, so the depth of shower maximum (X_{\max}) is measured directly. The cosmic ray composition is studied in different energy ranges by comparing the observed X_{\max} distribution with predictions from air shower simulations for different nuclei. The change of with energy (elongation rate) is used to derive estimates of the change in primary composition. We also investigate the width of the X_{\max} distribution as an additional mass-sensitive observable.

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

The Pierre Auger 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 373-376

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