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An Upper Limit On The Cosmic Gamma Ray Flux Above 40 EeV Using HiRes Stereo

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Abstract content

Measuring the cosmic gamma ray flux at super-GZK energies is of significance in both interpreting the GZK effect and putting constraints on exotic models of the origin of ultrahigh energy cosmic rays. At these energies, gamma ray primaries interact with the earth's magnetic field before they enter the atmosphere. We have developed a simulation of gamma ray preshowers to study their effect on the profile on the extended air shower. By comparing the measured X_{max} distribution in the HiRes stereo data to both gamma ray and hadronic Monte Carlo simulations, it is possible to derive an upper limit on the gamma ray fraction measured. We also calculate the individual likelihood that each of the cosmic rays with energies above 40 EeV observed by HiRes was a gamma ray.

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 455-458

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