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UHE Neutrino Flux Limits: From Parkes Onwards

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Abstract content

The Lunar Cherenkov technique, which aims to detect the coherent Cherenkov radiation produced when UHE particles interact in the lunar regolith, was first attempted with the Parkes radio-telescope in 1995, though the theory was not sufficiently developed at this time to calculate a limit on the UHE neutrino flux from the non- observation. Since then, the technique has evolved to include experiments utilising lower frequencies, wider bandwidths, and entire arrays of antenna. Simulations of the technique have likewise evolved, providing new insight into the dependence of experimental sensitivity on the set-up. We develop a simulation to analyse the full range of experiments, and calculate the UHE neutrino flux limit from the Parkes experiment, including the directional dependence. Our results suggest a methodology for planning future observations, and demonstrate how to utilise all available information on the nature of radio pulses from the Moon for the detection of UHE particles.

If this papers is presented for a collaboration, please specify the 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. 5 (HE part 2), pages 1503-1506

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