



Contribution ID : 478

Type : **Poster**

Simulations of a particle detector array for the Jicamarca Radio Observatory to study extended air showers using radar

Friday, 6 July 2007 14:45 (0:00)

Abstract content

It has previously been suggested that the Jicamarca Radio Observatory (JRO) could be used for the detection of extended air showers using radar echo [1]. The use of radar is appealing as it could allow to map the longitudinal development of air showers through the atmosphere. This paper presents studies on the implementation of an array of particle detectors (scintillator, water tank) at the JRO. The particle detectors serve the purpose of providing a known method for the detection of extended air showers against which to compare radar observations. Secondly, in a scenario where extended air showers can be detected by radar, it will be unfeasible to maintain the radar source continuously active. For this reason, a particle trigger which could set off the radar pulse to detect the ionisation trail would be a necessary addition to the JRO if it is to be used for many hours as a cosmic ray detector. This paper presents studies on the design of a particle detector array for use as a trigger and providing information on air showers based on simulations.

[1] T. Vinogradova et al. in 1st International Workshop on Radio Detection of High Energy Particles. 2000. University of California

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'Olive, 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 957-960

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Session Classification : Posters 2 + Coffee

Track Classification : HE.1.5