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RADIODETECTION OF ASTRONOMICAL AND ATMOSPHERIC PHENOMENA IN THE COSMIC RAY DEDICATED CODALEMA EXPERIMENT

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Abstract content

The main goal of the CODALEMA experiment, located in the Station de Radioastronomie de Nançay, France, is the radiodetection of extensive air showers initiated by high energy cosmic rays using log-periodic antenna and short active dipoles in the 1-200 MHz bandwidth. First results showed that both antennas are able to detect the transient radio signals emitted by extensive air showers. In addition to the detection of cosmic rays, astronomical observations have been also performed with these antennas allowing an estimation of the absolute CODALEMA performances and a calibration of the antennas. After a brief technical description of both antennas, the radio observation of a solar flare during January 2005 is presented and the possibility to use the sun to estimate the CODALEMA angular resolution is shown. In a second part, the CODALEMA sensitivity to the galactic radio signal is demonstrated and a method to calibrate each antenna with this signal is described. Finally, it is shown that the wide detection acceptance and frequency range offer a strong sensitivity to distant atmospheric electric-field evolutions like thunderstorms and related phenomena.

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

The CODALEMA collaboration

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Oliveo, 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 921-924

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