Contribution ID : **983** Type : **Poster**

# Trigger for Ultra High Energy Cosmic Rays detection for LOFAR

*Wednesday, 4 July 2007 14:45 (0:00)*

## Abstract content

Using all stations of LOFAR we are planning to explore the possibility of using Moon as a detector of ultra high energy (>10 21 eV) cosmic rays. The idea is to cover the whole visible lunar surface and to look for short pulses of Cherenkov radiation emitted by showers induced just below the surface of the Moon when the cosmic rays strike it.
In the LOFAR station, a large number of digital data streams coming from the receivers are filtered and combined into a single, beamformed digital signal stream per station. This processing takes place in the cascade of a filterbank and a beam-former at station level, however triggering for radio pulses will be performed on a tied array beam formed at central processing level.
Therefore, in order to implement this trigger we need to invert the station level digital processing at central processing level to achieve the required accuracy for triggering of real time signal. Additionally, pulse will be influenced by the ionosphere of the earth; therefore coherent dedispersion follow up is required to retrieve the original signal.

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

LOFAR (Low Frequency Arrays)

## 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 429-432

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**Session Classification :** Posters 1 + Coffee

**Track Classification :** HE.1.4.A