Contribution ID: **144** Type: **Oral**

Radio Detection of Cosmic Rays at the Auger Engineering Radio Array

Friday, 6 June 2014 12:20 (20 minutes)

The Pierre Auger Observatory detects ultra-high energy cosmic rays by measuring extensive air showers induced in the earth's atmosphere. Besides established detection techniques using a 3000 km2 array of particle detectors sampling shower particles at ground level, and detecting fluorescence light emitted during the shower development with telescopes, the Observatory explores the potential of radio detection of cosmic rays with the Auger Engineering Radio Array (AERA). Radio detection has the potential to provide information on e.g. cosmic ray shower properties with a duty-cycle not limited by day and moon light as in case of the fluorescence technique.
AERA consists of 124 autonomous detector stations sensitive to MHz frequencies. The stations feature dual-polarized radio antennas, custom low-noise analog and digital electronics and a broad-band wireless communication system. With AERA we face the challenge of self-triggering on the radio pulse in a background dominated environment by implementing various real-time signal processing strategies within the station electronics. Complementary, we explore the potential of the radio technique as an integral part of future multi-component detectors by utilizing trigger information from the other Auger detectors and recently, by particle detectors integrated in the radio stations. We will discuss the current cosmic ray measurements and the status and prospects of AERA.

Primary author: Mr WEIDENHAUPT, Klaus (RWTH Aachen University)

Co-author: AUGER COLLABORATION, Pierre (Observatorio Pierre Auger)

Presenter: Mr WEIDENHAUPT, Klaus (RWTH Aachen University)

Session Classification: II.b Astro & Space

Track Classification: Experiments: 2b) Astrophysics and Space Instrumentation