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# Cosmic ray physics with the Auger Engineering Radio Array (AERA)

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The Auger Engineering Radio Array (AERA) consists of 153 autonomous radio stations at the site of the Pierre Auger Observatory in Malargüe, Prov. of Mendoza, Argentina. With an area of 17 km^2 covered, AERA is the largest radio-detector worldwide for UHECR physics. The radio stations are sensitive in the 30 to 80 MHz band to the coherent radio signal emitted by the electromagnetic air shower component.

Steady progress in radio-detection techniques and a very good understanding of the radio emission mechanism made AERA a capable tool for cosmic-ray physics: We use AERA radio data to reconstruct the arrival-direction and the energy of the air-shower with a precision competitive to standard reconstruction techniques. Even the determination of the absolute energy scale seems possible. The primary mass composition is determined from the distribution of the shower maximum, which is currently measured with a precision of 40 g/cm^2 by the radio method. Since radio measurements are purely sensitive to the electromagnetic component of the air shower, they can be combined with measurements of particle detectors for an additional way to estimate he mass of the primary particle by means of the electron-muon-ratio.

This contribution reviews the recent analysis methods for radio signals and shows some results for the determination of air-shower properties gained with AERA.

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