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Radio detection of cosmic rays with the Auger Engineering Radio Array.

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The very low statistics of cosmic rays above the knee region make their study possible only through the detection of the extensive air showers (EAS) produced by their interaction with the constituents of the atmosphere. The Pierre Auger Observatory located in Argentina is the largest high energy cosmic rays detection array in the world, composed of fluorescence telescopes, ground particle detectors and radio antennas. The Auger Engineering Radio Array (AERA) is composed of 153 autonomous radio stations that sample in the 30 MHz to 80 MHz frequency range the radio emission of the extensive air showers. It covers a surface of 17 km², has a 2π sensitivity to arrival directions of UHECR and provides a duty cycle close to 100%. The electric field emitted by the secondary particles of an air shower is highly correlated to the primary cosmic ray characteristics like energy and mass and the emission mechanisms are meanwhile well understood. In this contribution, recent progress on the reconstruction of the mass composition and energy measurements with AERA will be presented.

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