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4. High energy cosmic rays (HE-CR I)

Radio detection of air showers at the Pierre Auger Observatory

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High-energy cosmic rays impinging onto the atmosphere of the Earth induce cascades of secondary particles: extensive air showers. Many of the particles in a shower are electrons and positrons. The induced electrons and positrons interact with the geomagnetic field and emit radiation. We detect such radiation at frequencies of tens of MHz with the Auger Engineering Radio Array (Aera) in Argentina. Objective is to investigate the properties of cosmic rays at the expected transition from a Galactic to an extragalactic origin at energies around 10^{17} to 10^{18} eV. We will discuss the recent progress in radio detection of High-energy cosmic ray with Aera. To this end, we will elaborate on the shower reconstruction methods and our measurements of shower properties, such as the lateral distribution of the radio emission at ground level. In addition, we will present methods to reconstruct the properties of the primary particle from the radio data.