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## Radio Detection of Cosmic-Ray-Induced Air Showers at the Pierre Auger Observatory

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AERA — the Auger Engineering Radio Array — is currently being set up at the southern site of the Pierre Auger Observatory. AERA will explore the potential of the radio detection technique to cosmic ray induced air showers with respect to the next generation of large-scale surface detectors. As AERA is co-located with the low energy enhancements of the Pierre Auger Observatory, the observation of air showers in coincidence with the Auger surface and fluorescence detectors will allow us to study the radio emission processes in detail and to calibrate the radio signal. Finally, the combined reconstruction of shower parameters with three independent detectors promises new insights into the nature of cosmic rays in the transition region from  $10^{17}$  to  $10^{19}$  eV. Besides the detection of coherent radiation in the MHz frequency range, the setups AMBER [1] and MIDAS [2] prepare to check the possibility to detect air showers due the emission of molecular bremsstrahlung in the GHz range at the Auger site. We present the status of the radio detection setups and discuss their physics potential as well as experimental challenges. We will focus on the first installation phase of AERA which is the startup to the construction of a  $20 \text{ km}^2$  radio array.

\noindent [1] Air-shower Microwave Bremsstrahlung Experimental Radiometer\\

\noindent [2] Microwave Detection of Air Showers

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