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Radio Detection of Horizontal Extensive Air Showers with AERA

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AERA, the Auger Engineering Radio Array, located at the Pierre Auger Observatory in Malargüe, Argentina measures the radio emission of extensive air showers in the 30-80 MHz frequency range. It consists of 124 antenna stations of which 24 are log periodic dipole antennas (LPDAs) and 100 are so-called butterfly antennas. Both antenna types measure two electric field components (North-South and East-West) and are optimized for the detection of air showers up to 60° zenith angle. Together with the Auger surface detector, the fluorescence detector, as well as the muon detector of AMIGA, AERA is able to measure cosmic rays with energies above 10^{17} eV in a hybrid detection mode.

Simulation studies have shown that for the reconstruction of inclined air showers the vertical electric field component becomes important. To investigate and improve the sensitivity of AERA to inclined showers, prototype stations including tripole antenna stations and whisk-type antennas as enhancement of the butterfly antennas have been deployed on the AERA site in November 2013. To study the emission in lower frequencies around 1 MHz one low-frequency tripole station has been deployed as well.

In this contribution the motivation, the status, and first results of the analysis of horizontal air showers with AERA including the new prototype stations will be presented.

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