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Mass composition measured by LOFAR

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High-energy cosmic rays, impinging on the atmosphere of the Earth initiate cascades of secondary particles, the extensive air showers. The electrons and positrons in the air shower emit electromagnetic radiation. This emission is detected with the LOFAR radio telescope in the frequency range from 30 to 240 MHz.

The data are used to determine the properties of the incoming cosmic rays. The radio technique is now routinely used to measure the arrival direction, the energy, and the particle type (atomic mass) of cosmic rays in the energy range from 10^{17} to 10^{18} eV.

This energy region is of particular astrophysical interest, since in this regime a transition from a Galactic to an extra-galactic origin of cosmic rays is expected.

Recent results from LOFAR will be reviewed and their implications on our understanding of the origin of high-energy cosmic rays will be discussed.

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