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## Cosmic-rays with LOFAR: Overview and Upgrades

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The LOFAR radio telescope measures the radio emission from extensive air showers generated by cosmic rays in the energy range of  $10^{16}$  to  $10^{18}$  eV. Measurements of the emission in the 30-80 MHz range allows for the reconstruction of the cosmic ray energy, arrival direction, and most importantly the shower maximum,  $X_{\text{max}}$ , with an average precision below  $20 \text{ g/cm}^2$ . The detector consists of a densely instrumented antenna array and a triggering scintillator array which has been recently extended to double its previous size. In this contribution, we present the overview of the detector, on-going analyses, and plans for improved cosmic ray detection with the upcoming LOFAR 2.0 upgrade.

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