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## **Measurement of the polarization of the radio emission in air showers with LOFAR and the influence of atmospheric electric fields.**

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With the LOFAR antenna array we have measured the polarization footprint of the radio emission from extensive air showers for a large number of single events. The polarization direction is determined from the Stokes parameters integrated over the time duration of the radio pulse.

It will be shown that for events for which no thunderstorm activity has been registered the polarization pattern obeys very well the expected characteristics based on a superposition of a geomagnetically-induced transverse current and charge excess contributions. The core-distance dependence of ratio of the two contributions is measured.

For events where thunderstorm activity is registered strong deviations from the fair-weather polarization pattern are observed. A semi-quantitative interpretation of the influence of atmospheric electric fields on the polarization pattern will be presented.

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