Geophysical Research Abstracts
Vol. 21, EGU2019-7555, 2019
EGU General Assembly 2019


# Using a short-range quasi-electrostatic thunderstorm detector for lightning safety and research

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Monitoring of lightning activity and atmospheric electric field variability around a site, using the quasi-electrostatic field change in the range 1-45 Hz, is described. The present sensor is especially useful for sites where the continuous monitoring and interpretation of rain radar or satellite images is impractical, and internet may not be available. In addition, it offers a low-cost, user-friendly interface and maintenance-free complementary method for well-established regional lightning detection networks, to increase the performance around a limited specific area, including the harsh marine environments of offshore installations.

The further potential to detect signals from powerful lightning located up to 1,000 km away from the sensor is also investigated. These flashes are often associated with transient luminous events in the upper atmosphere above thunderclouds. An analysis of recordings, related to an unusually intense storm in South West UK in May 2017, is presented. During the storm, 23 sprites occurred and were captured by the UK Meteor Network camera in Wiltshire (UK). We focus this study on positive cloud-to-ground discharges both associated and not associated with TLE, showing a correlation between the measured signal amplitudes and the CG+ peak currents as estimated by Meteorage. A further characterization of the events analysed includes the reconstructed current moment waveforms and charge moment changes from the ELF station in Hylaty (Poland). A bias towards remote high peak current sources, exceeding 100 kA, suggested a possible application for the sensor as a proxy for the occurrence of intense discharges, including those associated with TLE, especially when optical ground-based observations are not available.