



Towards more Global Coordination of Atmospheric Electricity Measurements (GloCAEM)

Keri Nicoll (1,2) and Giles Harrison (1)

(1) University of Reading, Meteorology, Reading, United Kingdom (k.a.nicoll@reading.ac.uk), (2) Department of Electronic and Electrical Engineering, University of Bath, United Kingdom

Earth's atmospheric electrical environment has been studied since the 1750s but its more recent applications to science questions around clouds and climate highlight the incompleteness of our understanding, in part due to lack of suitable global measurements. The Global Electric Circuit (GEC) sustains the near-surface fair weather (FW) electric field, which is present globally in regions which are not strongly electrically disturbed by weather or pollution. It can be measured routinely at the surface using well established instrumentation such as electric field mills. Despite the central role of lightning as a weather hazard and the potentially widespread importance of charge for atmospheric processes, research is hampered by the fragmented nature of surface atmospheric electricity measurements. This makes anything other than local studies in fortuitous fair weather conditions difficult. In contrast to detection of global lightning using satellite measurements and ground-based radio networks, the FW electric field and GEC cannot be measured by remote sensing and no similar measurement networks exist for its study. This presents an opportunity as many researchers worldwide now make high temporal resolution measurements of the FW electric field routinely, which is neither coordinated nor exploited. The GLOCAEM (Global Coordination of Atmospheric Electricity Measurements) project is currently bringing some of these experts together to make the first steps towards an effective global network for FW atmospheric electricity monitoring. A specific objective of the project is to establish the first modern archive of international FW atmospheric electric field data in close to real time to allow global studies of atmospheric electricity to be straightforwardly and robustly performed. Data will be archived through the UK Centre for Environmental Data Analysis (CEDA) and will be available for download by users from early 2018. Both 1 second and 1 minute electric field data will be archived, along with meteorological measurements (if available) for ease of interpretation of electrical measurements. Although the primary aim of the project is to provide a close to real time electric field database, archiving of existing historical electric field datasets is also planned to extend the range of studies possible. This presentation will provide a summary of progress with the GLOCAEM project.