



Introduction to the special issue “Atmospheric electrical observatories”

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Atmospheric electricity is a long-established subject, with the discovery of the atmospheric electric field away from thunderstorms and the identification of lightning as electricity both dating from the mid-18th century (Aplin et al., 2008). Systematisation of atmospheric electricity measurements began with the establishment of many geophysical observatories as part of the “magnetic crusade” and the professionalisation of science in the 1830s (e.g. Macdonald, 2018). Although this special issue is focused on the contributions made by observatories, historic atmospheric electricity measurements can be valuable for contemporary science and technology. For example, they can contribute to climatological studies of convective storms (Valdivieso et al., 2019) as well as new insights into space weather (e.g. Aplin and Harrison, 2014) and air pollution (Harrison and Aplin, 2002). Beyond the observatory network, there are numerous other accounts of historical atmospheric electricity observations from across the world. Most are short-lived, some predate the establishment of observatories, and others were made by the amateur scientists of the day. These have been tabulated and are available online (<https://glocaem.wordpress.com/historical-datasets/>, last access: 1 July 2020); further items to add are welcomed.

Some of the observatories with long datasets or that were otherwise historically significant have already been described; for example, the longest known atmospheric electric field time series is from Kew Observatory near London, UK, with a historical account by Macdonald (2018) and scientific analysis by e.g. Harrison (2006). During a recent project, GloCAEM, which produced a worldwide atmospheric electric field database (Nicoll et al., 2019), it became apparent that historic data were available and in principle submittable to the database, but that the sites of and background to these measurements had not been fully described. Historic datasets and observatories are also regularly discussed at meetings of

the international COST action CA15211, a European atmospheric electricity networking project.

This special issue has been motivated by scientists in the atmospheric electricity community requesting an opportunity to explain the scientific and historical context of their data series. It encourages, but is not limited to, submissions on historical atmospheric electricity measurements focused on the observatories participating in the GloCAEM project and COST action. Broader submissions discussing other atmospheric electricity observatories are also welcomed, with no requirement to be involved with either project. It is anticipated that submissions will describe the history of the observing site and the role of key individuals. The atmospheric electrical observations and techniques should be discussed as well as any other relevant measurements, such as magnetic or meteorological, at the site. Significant events during the observing period and their effect on the data can also be described. The data from the observatory should be linked to or cited if available elsewhere, and if not, some brief data summaries may be included. Accounts of other observatories, not measuring atmospheric electrical quantities, should be submitted to the parallel special issue (https://hgss.copernicus.org/articles/special_issue11.html, last access: 30 June 2020) in this journal on the history of geophysical institutes and observatories (Arora et al., 2013).

Special issue statement. This article is part of the special issue “Atmospheric electrical observatories”. It is not associated with a conference.

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