



## **Investigating the link between thunderstorm activity and the long-term variation of atmospheric electrical potential gradient**

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The relation between the long-term changes in the global thunderstorm activity and Earth's climate has been long in the scope of scientific studies and the importance of these investigations is well recognized [1, 2]. The atmospheric electrical potential gradient (PG), measured near the ground, is a widely monitored DC parameter which is used to characterise the global atmospheric electric circuit (GEC) which is powered by the global thunderstorm activity. An exceptionally long PG time series measured in the Széchenyi István Geophysical Observatory (NCK, 47°38' N, 16°43' E), at Nagycenk, Hungary [3] since 1962, provides a unique opportunity to investigate the relation between the long-term variation of the DC atmospheric electric field and the changes in the regional and global thunderstorm activity.

Thunderdays are days on which thunder was heard and/or lightning was seen at an observation site. The registration of thunderdays has been a routine task in meteorology for decades. This allows examining the occurrence statistics of thunderstorms in historic time periods when modern lightning detection techniques were not available.

In this poster, we discuss the extent to which the effect of regional climate change, as mirrored by the statistics of thunderstorm occurrences in Central Europe, can be recognized on long-term variation of PG data. This study is based on the comparison of PG data measured at NCK and the variation of regional thunderstorm activity mirrored by thunderday observations at European stations in the same region with NCK in the time period of 1962-2007.

[1] PRICE, C., 2009, *Lightning: principles, instruments and applications*, Springer, New York, pp. 521-535.

[2] WILLIAMS, E., 2005, *Lightning and climate: A review*, *Atmos. Res.*, 76:272-287.

[3] BENCZE, P. & MÁRCZ, F., 1981, *The geophysical observatory near Nagycenk: Atmospheric electric and ionospheric measurements*, *Acta Geodetica et Geophysica Hungarica*, 16(2-4):353-357.