



## **Meteorological characteristics of red sprite producing thunderstorms above Hungary**

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Red sprites are brief luminous optical emissions accompanying electric discharges in the mesosphere. Such discharges dominantly occur after intense +CG lightning flashes. The ~50-90 km height range in which sprites can be observed was monitored above 4 thunderstorm systems running above Hungary in the summer months of 2007, 2010, 2011, and 2012. Observers in Sopron (16.58 E, 47.68N, 234 m MSL) in Hungary, and in Nydek (18.77E, 49.67N, 482 m MSL) in the Czech Republic used their optical detection systems in order to record any sprites these storms may produce. In periods of their evolution in time, some regions of the monitored thunderstorms produced sprites which were detected by the observers, while in other periods and above other regions no red sprites were detected.

The poster summarizes the findings from our analysis which has attempted to identify measurable meteorological properties having characteristic values during the periods of sprite production in thunderstorms. Data considered in the analysis included cloud top heights and cloud top temperatures deduced from METEOSAT IR imaging and DWSR weather radar intensities (vertical composites) both of which has been provided by the Hungarian Meteorological Service (time resolution is 15 min., spatial resolution is 2 km), as well as information about lightning strokes (occurrence time, polarity, type (CG or IC), peak current, and geographical location) provided by the LINET lightning location network.

No quantity we deduced from the available data was found to show characteristic tendencies which was commonly present in all cases and according to which sprite producing and not sprite producing periods could be unambiguously separated in the examined thunderstorms. On the other hand, the distribution of radar reflectivity values and the contrast between the average and extremal values of cloud top heights and temperatures suggests formation of a trailing stratiform region in those extended thunderstorms which produce sprites.