CLOUD-TO-GROUND LIGHTNING ACTIVITY IN ROMANIA FROM 2003 TO 2006

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I. INTRODUCTION

Thunderstorms play a very important role in today society. In general convective storms are associated with flash-flood, hail, strong winds. In Romania climatologies for the weather phenomena mentionated above has been developed. However, the annual and diurnal distribution of cloud-to-ground (CG) lighting has not been done for the Romania using a lightning detection network.

This paper presents, for the first time, the spatial and temporal distribution of CG lightning over contiguous Romania.

II. PRESENTATION OF RESEARCH

Lightning sensors manufactured by VAISALA have been combined in to the Romanian National Lightning Detection Network (RNLDN) since August 2002 (Ivanovici, 2005). The 8 lightning detectors are located in: Tarcu Peak, Rociu, Movileni, Furculesti, Grivita, Poiana and Rosia Montana (Fig. 1).

The RNLDN has been designed to provide national coverage for both intra-cloud and cloud-to-ground discharges with a location accuracy of 0.5 km and detection efficiency at 95%.

Lightning data provided by the RNLDN were analyzed for a 3 year period (2003–2005) to determine the all ground flashes density, positive flashes, the percentage of positive lightning, peak currents for negative and positive lightning, and for negative and positive multiplicity.

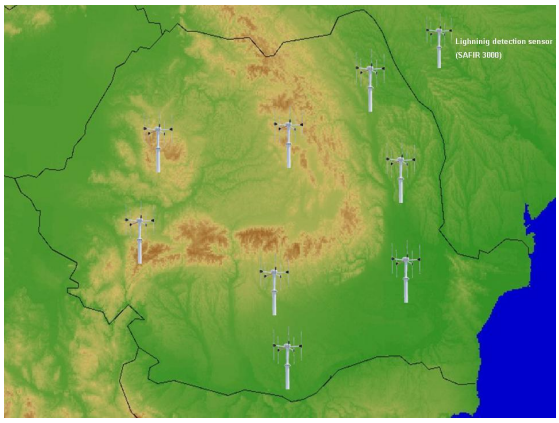

FIG. 1: The Romanian National Lightning Detection Network.

III. RESULTS AND CONCLUSIONS

Over most of the contiguous Romania, the highest density of CG lightning was observed during June–August and were seen to be associated with mountainous areas, while the lowest values were found during the winter. A larger fraction of negative lightning was produced during summer than positive lightning, and the diurnal cycle of negative lightning exhibit maximum in the afternoon to early evening. For the same period of study the data from RNLDN were used to create a lightning climatology for the southern part of Romania. The CG lightning data were classified according to the flow regime each day was placed into based on radiosonde-derived low-level winds using the mean vector between 1000 and 700 hPa.