Severe storm forecasting based on lightning and radar data - urban areas application

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From August 2002 a lightning detection network (LDN), SAFIR3000 has been operating in Romania. In the present paper we present a method for monitoring and very short range forecasting of electric activity associated with deep convection. This method consist in three steps: first, the estimation of the convective potential of a day using a probabilistic method and a set of thermodynamic thresholds with climatologic specific values for southerns region of Romania thus, resulting a forecast with 6 hours anticipation. The second step is applied once the convective activity is initiated, monitored with Doppler radars (NEXRAD WSR-98D); then are used thresholds for reflectivity and heights of characteristic isotherms ($-10°$ and $-15°$C), resulting a forecast of the onset of cloud-to-ground electrical activity. The third step is the monitoring of convective activity by combining radar and total lightning activity data. Displacements of convective cells identified by radar tracking algorithm for WSR-98D, were compared with displacements identified by lightning track algorithm. The present method is based on the processing of real time radar and lightning data from SIMIN (National Meteorological Integrated System), on upper air sounding data and numerical models. A theoretical conceptual model of convective electrical activity specific for Romania is used. We present the results after the first operational season.