



Radar derived characteristics of hail events in Czechia

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The work aims at the identification of differences in radar based characteristics for severe hail events and convective heavy rain events. The set of events and the corresponding single polarization radar data come from the Czech territory. Two sets of events from May-August 2007-2014 are studied. The first set contains severe hail events and the second one contains convective local heavy rains without hail occurrence. The event occurrence is described in time and space windows with various dimensions.

First, we evaluate the efficiency of several hail detection criteria at the both sets to estimate the false alarm characteristics. The basic idea in the hail detection consists of the occurrence of high reflectivity values in upper levels above the height of zero isotherm. However, there is no characteristic related to the time evolution the upper level high reflectivity. Therefore, in the second part, we analyse the structure of radar reflectivity field and its time evolution around the time of event occurrence. The attention is paid to the time development of radar characteristics like vertical reflectivity profiles and the height and occurrence of specific high reflectivity values. The comparison is based on absolute height values as well as relative to the freezing level. The differences in the rise and fall of radar parameters during the time evolution of hail and rain events are studied.

The indication of characteristics connected with severe hail events is supposed to improve the detection of hail evolution for nowcasting. The contribution uses single polarization radar data because the extended historical data set is available for the Czech region. The case studies using the new dual polarization data from the Czech territory start at present.