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The preconvective environments with potential orographic modification over the Western Carpathians during the severe convective storm events

Róbert Kvak (1,2) and Petr Zacharov (1)

(1) Institute of Atmospheric Physics CAS, Meteorology, Prague 4, Czech Republic, (2) Charles University in Prague, Faculty of Science, Department of Physical Geography and Geoecology, Albertov 6, Prague 2, 128 43, Czech Republic

The issue of deep atmospheric convection is becoming more complicated over complex terrain especially within mountains in mid-latitudes. A gap of knowledge exists inside interaction between convective storms occurrence and convective environment. The aim of this outlook is qualitatively analyzing a bond between terrain – convective environment – dynamics of thunderstorms, searching for cases, in which mountains can enhance the potential for severe thunderstorms in their close proximity. The area of interest covers the geomorphological unit of the Western Carpathians within the domain of Slovak weather radar network range (300 x 500 km). Digital elevation model is described by the specific morphometric characteristics (e.g. altitude). The most severe convective storm events in warm parts of the years 2010 – 2018, primarily since 2015, are studied. Multiple events are chosen thanks to lightning and radar detection networks, and complete observational reports (SHMI). Based on ERA-interim reanalysis as initial and boundary conditions, basic fields of physical quantities (e.g. dew point) and convective indicators (e.g. Bulk Richardson Number) are performed using numerical weather prediction model COSMO during the events. COSMO is the non-hydrostatic compressible model with the 2.8 km grid-spacing and 50 atmospheric model levels up to a height of 20 km. The products of simulations (starting time at 00 UTC) are compared with basic morphometric characteristics of the topography using DEM with appropriate spatial resolution. In addition to the convective diagnostics variables the maximal vertical reflectivity is simulated to verify the COSMO‘s capability of forecasting severe convection storm activity in a mountainous region.