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Proximity sounding parameters obtained from ECMWF Analyses as predictor for local severe storm types in Europe.

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This study describes the environmental atmospheric characteristics in the vicinity of different types of severe convective storms in Europe during the warm season in 2006 and 2007. A sample of 3406 severe weather events from the European Severe Weather Database (ESWD) is examined and provides information about different types of severe local storms, like significant or weak tornadoes, large hail, damaging winds and heavy precipitation. These data were combined with EUCLID lightning detection data, which provide well-defined null cases on a European scale to distinguish between severe and ordinary or no thunderstorm activity. ECMWF T799 analyses are used to calculate sounding parameters in close proximity to reported severe event locations, for every day within the investigated time period.

Instability indices and CAPE have considerable skill to predict the occurrence of thunderstorms and the probability of severe events. In addition, low level moisture can be used as a predictor to distinguish between significant tornadoes or non-severe convection. Most events associated with wind gusts occurred during high synoptic flow situation reveal the downward transport of momentum as the most important factor. While deep-layer shear discriminates well between severe and non-severe events, the storm relative helicity in the 0-1 km (and surface to lifting condensation level) layer adja-

cent to the ground has more skill in distinguishing between environments favouring significant tornadoes and wind gusts versus other severe events. Additionally, composite parameters that combine measurements of buoyancy, vertical shear and low level moisture have been tested to discriminate between severe events.

No parameters have been found, which distinguish well between significant tornados and local severe wind events.