

7.16 NOWCASTING OF THUNDERSTORM AND HAIL EVENTS USING GROUND BASED REMOTE SENSING DATA

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Ground-based remote sensing data are essential for the nowcasting of severe weather, such as thunderstorm and hail events. For this, not only the detection of mature thunderstorms is necessary, but also the identification of the preceding phase which shows the convective growth including attendant phenomena such as hail formation.

Within this contribution, radar and lightning data analyses are shown in combination with NWP and synoptic data. Modern radar data products can help to recognise hazardous weather situations. Products derived from 3D volume radar data by vertical integration, i.e., vertically integrated liquid (VIL) and vertically integrated ice (VII), have proven to be good indicators for thunderstorm development and hail formation.

This contribution will demonstrate in case studies and by means of statistical analysis how the different radar and lightning parameters are related and how their combined use can help to extract crucial information, so that warning lead time can be increased. Statistical analysis reveals that VIL is a good indicator for cell development and that VII can be utilised to estimate hail size and lightning activity. The case studies confirm that sudden increases in lightning activity are often linked with the occurrence of hail events. In some cases, a clear extension of the warning lead time is visible. For these cases, atmospheric environmental conditions extracted from NWP data are additionally presented.