



Convection-resolving model simulations using the Lokal Modell (LM) - Process-based model evaluation using radar and ground based observations

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Convective precipitation accounts for most of the summer precipitation in South-West Germany and can lead to significant monetary losses due to hail and/or wind gusts. The need of accurate forecasting of convective events motivated the development of high-resolution numerical weather prediction models that resolve the processes inherent to atmospheric convection. At the German Weather Service (DWD), a high-resolution version of the Lokal Modell (LM-K) has been developed for the short-range forecast (< 18 h) employing a horizontal resolution of about 2.8 km and will be used for operational weather forecast starting in 2006.

Here, we use the current version of the LM-K to investigate the processes that led to convective precipitation in the South-West Germany on 19 June 2002. The meteorological situation was characterised by weak synoptic forcing in the lower atmosphere over the region of interest, an intense cold front to the west, and a filamentary positive PV anomaly in the upper troposphere. Radar observations show localised convective cells in the afternoon, and more organised convection during nighttime. The model results are used to investigate in detail the processes that lead to the preconditioning of the atmosphere and the initiation of convection. The results will be evaluated using remote sensing (satellite, radar) observations and in-situ measurements obtained within the VERTIKATOR project. The potential of the model simulations to study this event, the shortcomings of the simulations, and possible reasons will be discussed.