



Development of key atmospheric parameters during thunderstorm development in Central Europe

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Thunderstorm occurrence and severity are dependent on temporal change of atmospheric conditions. A well-known key parameter is the Convective Available Potential Energy (CAPE) which is released during the storm itself. Vertical shear is also a relevant parameter due to its role for the self-organization of the system. We suggest also considering the Dynamic State Index (DSI) which indicates especially the release of latent heat and non stationary processes. Based on the energy-vorticity theory, the DSI combines the conservation of energy with the conservation of Ertel's potential enstrophy. In this contribution, we focus on the temporal development of the atmospheric parameters during passages of thunderstorms identified from lightning data provided by nowcast GmbH. Atmospheric data for the period May to September 2007 are taken from operational analyses of the German Weather Service, using the operational COSMO-DE limited area high resolution model with a horizontal resolution of 2.8 km and 51 layer. It is found that the decrease of CAPE and the increase of DSI values occur before the thunderstorm has reached a certain location, maximizing shortly after the thunderstorm arrival. The changes depend on thunderstorm severity.