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High-resolution numerical forecast of convective precipitation systems: sensitivity analysis to microphysical parameterization using COSMO-MODEL and MM5

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Numerical weather forecast of severe weather has received an increasing attention in the hydro-meteorological community. It is well known that the Planetary Boundary Layer (PBL) fluxes are one of the most important mechanisms to trigger convective cells. Therefore, in order to be able to reproduce these mechanisms a numerical meteorological model has to be non-hydrostatic so that relatively high spatial resolution can be achieved. In this work two non hydrostatic models, COSMO-MODEL and MM5, have been used to simulate a convective structure on the Po Valley (Italy). The two C-band radars have simultaneously measured a rainfall event on May 20, 2003 from two different locations, S.Pietro Capofiume and Gattatico, revealing strongly localized convective cells. The mesoscale models have been run in the same configuration, with a special attention to boundary conditions and microphysical parameterizations. Sensitivity tests have been carried out using several microphysical schemes to the aim of investigating the different hydrometeors production to be compared both the available radar data and hydrometeor classification from dual-polarized weather radar. Finally, further comparison have been performed with pluviometric network and the analysis of the results for this case study will be presented and discussed.