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A review of microphysics schemes within WRF model on the example of an isolated tornadic supercell in Poland on 20 June 2016

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In the morning of 20 June 2016 an isolated convective cell developed in the northern Slovakia, and under the influence of a strong vertical wind shear reorganized into tornadic supercell. Reflectivity recorded by the radar in Kojsovska Hola (Slovakia) reached value of 65 dBZ and a “three body scatter spike” structure was possible to observe. This thunderstorm produced hail with diameter up to 5 cm and in the late afternoon, a tornado in the south-eastern Poland. A mesoscale simulations within the use of WRF model were performed to test different microphysics schemes for mentioned case. A domain with a grid size of 1 x 1 km was chosen for the analysis. A period from the formation of cell (10 UTC) to its disintegration (18 UTC) including the whole track of a supercell was analyzed. Obtained results are compared with data from GFS global model and meteorological radar scans. Sounding-derived indices and data from surface meteorological observations are also taken into account. The main aim of this work is to analyze life-cycle of the supercell and possibilities of its short-term prediction with usage of the WRF simulation. The discussion on how microphysics schemes can affect simulation results is also included.