



Performance of WRF in Simulating the Hail Event over Istanbul on 27 July 2017

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A severe hail event took place over Istanbul on 27 July 2017. Hundreds of buildings and thousands of vehicles were damaged, and the cost was estimated to be around 300 Million US Dollars. This study investigates this hail event using the state-of-the-art Weather Research and Forecasting (WRF) model. The model domain is setup with 4 nested domains (27, 9, 3 and 1 km resolutions) for Northwestern Turkey with a central point at Istanbul (41.96°N 20.06°E). ERA-Interim Reanalysis dataset with 0.75°x0.75° spatial resolution is used as the initial and lateral boundary conditions for the model simulations that are performed for 30 hours starting from 18:00 UTC on 26 July 2017. The performance of the model in simulating the hail event was assessed by comparing the model outputs with the observations. Because the performance of the model with the default physics options was deemed poor, we conducted sensitivity simulations involving different combinations of the parameterization including microphysics, cumulus and boundary layer schemes. Amongst the different combinations, it is found that the hail event is best simulated when the model is run with NSSL 2-moment microphysics scheme, Multi-scale Kain-Fitsch cumulus scheme and MYNN2 planetary boundary layer scheme. The study is in progress, and further sensitivity simulations will be performed to understand whether the surface conditions have any role in the formation, intensification and location of the hail event.