Assessment of WRF model convection schemes for the prediction of convective storms over the United Arab Emirates

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United Arab Emirates (UAE) climate is characterized by hot and dry weather almost all year. But two weather regimes could be noticed for this region of the Arabian Peninsula: A cold and humid northwesterly flow during winter, from late November to early April, associated with intermittent and prompt episodes of rainy frontogenetic system depressions, in squall lines form, or with embedded convective cells; and a summer warm and very humid southeasterly flow induced by the Indian monsoon extension. The later could in some cases result from the tropical cyclone activities in the Indian Ocean. These two types of convection phenomena are generally very strong and in many cases accompanied by heavy rain (winter episodes) and hailstones (isolated summer thunderstorm cells). WRF model (Weather Research and Forecasting) is used to predict the different weather phenomena over the UAE and particularly the severe weather associated with the convective activity. This study aims to assess the different combinations of the built-in cloud physics schemes (microphysics, shallow and deep convection) along with different vertical and horizontal model grid resolutions in WRF framework, in the scope of simulating the above-mentioned types of weather events. For validation, conventional (automatic weather stations) and non-conventional observational data such as Doppler radars and satellite imagery will be used.