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On the sensitivity to horizontal and vertical resolution of WRF simulations over the Mediterranean basin

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This work summarizes the results of a set of sensitivity tests that were performed in order to obtain the best WRF-ARW configuration for a long term re-forecast of the mediterranean basin. Here, the results of a sensitivity study on the horizontal and vertical resolution of the simulations are presented. It is well known the positive role of increasing horizontal and vertical resolutions in numerical weather simulations. Generally speaking, the higher the resolution of the simulation, the better the representation of atmospheric processes. However, it is not clear if a relation between horizontal and vertical resolution of the configuration of numerical simulations should be kept. In the literature a wide spectrum of combinations of horizontal and vertical resolutions in the simulations is found. A series of 3-month long simulations on a Mediterranean domain with different combinations of horizontal and vertical resolutions were made. The results were validated to different observed and re-analysed fields in order to study the degree of improvement of each combination of vertical and horizontal resolution. Thus, the study attempts to provide an objective way to determine the appropriate resolution of a simulation based on meteorological aspects more than on computer limitations or personal experiences