

Summary

This study utilizes a newly developed regional coupled model (atmosphere-ocean-hydrology) to investigate the basic air-sea interactions in the Mediterranean region. Especially, different configurations for each module, such as turbulent parameterization, microphysics and so on, have been tested and the best configuration has been suggested. Further, assimilation experiments were conducted and results related to extreme events were presented.

This manuscript is generally well-written and well-structured. The result of this work is important to the regional climate research and prediction community. I therefore recommend Minor revision after a few modifications.

Recommendation: Minor revision

Minor Points:

- 1) Sections 2.1 and 2.2: Have you considered the possibility of using non-hydrostatic core under the current resolution setting? Especially for the cyclone study, the non-hydrostatic process is important for the atmosphere.
- 2) The resolution for the ocean reanalysis is too coarse. Have you

tried higher-resolution products? Such as The GLORYS12V1 product (the CMEMS global ocean eddy-resolving, $1/12^\circ$ horizontal resolution, 50 vertical levels).

- 3) Line 195: It is better to introduce all the observation and reanalysis products in the Data Section.
- 4) Line 227: s^{-1} should be s^{-1} . Please check similar mistakes in other parts of this manuscript.
- 5) Line 228-229: A little explanation for the wetter problem?
- 6) Line 299: What is the nudging time scale for the SST and SSS, respectively?