

Interactive comment on “AROME-WMED, a real-time mesoscale model designed for the HyMeX Special Observation Periods” by N. Fourrié et al.

Anonymous Referee #2

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General comments

This paper provides an overview about the numerical weather prediction model AROME-WMED especially designed for the two Special Observation Periods of the Hydrological cycle in the Mediterranean Experiment (HyMeX). Preparatory studies, the support of the instrument deployment during the field phase, as well as dedicated single or longer term case studies were the main motivation for its development. Besides the general model description including the data assimilation technique, the authors present a number of skill scores in comparison with the ones gained by the operational AROME-France model. A short description of a single case study is presented at the end. In general, the paper is very well written and most of the illustrations are ok (see

C309

further remarks below).

Specific comments

1. P1803, L15: The sentence starting with "Several studies..." does not fit in here.
2. P1810, L8-9: The authors state that the data from the balloons were discarded when they encountered strong updrafts. Please give more details why the data cannot be used.
3. P1813, L22-24: The authors just describe that the bias is positive during night-time and negative during day-time. Some ideas about the origin of this diurnal cycle would help the reader here.
4. Figs. 7, 15: I wonder why the relative humidity is analyzed. As it is linked to temperature, the errors are coupled as obvious from the opposing diurnal cycle. I would recommend to analyze the 2-m specific humidity instead.
5. The case study at the end is very interesting but too short in my opinion. A few comments on possible reasons for model deficiencies or more details about the relevant processes responsible for this heavy precipitation event would be useful.

Minor technical or textual comments

1. P1802, L9: observation instruments → meteorological instruments
2. P1803, L13: Meteo-rogologique → Meteorologique
3. P1803, L20: The authors state that due to the domain covered by AROME-WMED, it is better suited for HyMeX. This is clear, since it was developed especially for this project. Thus, this remark can be omitted.

C310

4. P1803, L26: COPS stands for: Convective and Orographically-induced Precipitation Study
5. P1804, L2: Please give some more details for ALADIN-France.
6. P1804, L15: mobile platforms
7. P1804, L18: Please explain the abbreviation ECMWF.
8. P1805, L26: ...of grid points **are** covered...
9. P1806, L7: ...model so as to avoid ... → model to avoid
10. P1806, L11: Please exchange performed with initialized or started.
11. P1808, L20: estimation of the estimation → estimation of the
12. P1810, L24: Please explain IASI.
13. P1812: Please explain CAPE and HOC.
14. P1813, L4: A rectangle showing the common area could be inserted in Fig. 1.
15. P1815, L12: ... from **the** HyMeX database
16. P1815, L13: ...had been subject to...
17. P1815, L17: ...if one 1 h datum was missing... → if one 1 h interval was missing
18. P1815, L21: no SYNOP nor climatological → neither SYNOP nor climatological
19. P1816, L1: The closer to 1 the ETS is, the better **is** the prediction.
20. P1820, L11: ... the **Intensive** Observation Period....

C311

21. P1820, L20: Fig. 19**b**
22. P1820, L22-25: This sentence is too long and confusing, please rephrase.
23. P1821, L7: The Andalusia precipitation maximum could be marked with a circle in Fig. 21b.
24. P1821, L10: ...are not located precisely as compared to observations... → are not located precisely at the observed locations.
25. P1822, L22: Once the field campaign **was** over...
26. Please enlarge the size of the following figures: 1, 6-8, 12, 15, 20-25
27. Fig. 2: SD → Standard deviation σ
28. Fig. 7: text on Figure a) 2m temperature at → 2m temperature; please write out SD in the caption
29. Fig. 12: AROME-WMED simulates much more precipitation on the Spanish coast south from the Pyrenees than AROME-FRANCE. The authors should add a comment on that.
30. Figs. 22 and 24: Please use the same colourbar ranges for observed and simulated brightness temperatures to facilitate the comparison.

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C312