

Interactive comment on “Analysis of an Extreme Weather Event in a Hyper Arid Region Using WRF-Hydro Coupling, Station, and Satellite data” by Youssef Wehbe et al.

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The manuscript presents a case study of mesoscale simulation of a severe cold-season rainstorm in eastern Arabia, where orography and small-scale variability are important factors, compared to ground-based and satellite data. I found it to be well written with a good review of relevant literature, and to make a useful contribution to a societally important concern.

My main comment is that since the standalone WRF also had the NOAA-MP land model, it is not clear to me why soil moisture feedback would improve precipitation simulations with WRF-Hydro but not standalone WRF. The difference between the two

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model configurations and its relevance to the simulation performance should be discussed in more detail.

Minor and technical comments:

abstract: Use the degree sign instead of "o"

2.7: rain gauges → rain gauge

3.32 and title: hyper arid: hyphenated or one word

4.9: rephrase to “The UAE (22° to 27° N) . . .”

4.22: rephrase to “receives more rainfall compared to the country’s 100 mm annual average”

5.28: clarify to what “Such frequencies” refers – L band?

7.22: “wadis” lowercase

8.30: does “analysed products” refer to ones interpolating station observations, or those from satellite retrievals or climate models?

9.10: boarder → border

13.12ff: I am not certain that WRF-Hydro includes lateral flow processes that would transport soil moisture. Please verify and give more details. Whether this transport happens in reality over the storm timescale would also need to be verified, which fits in with the authors’ call for a soil moisture measurement network.

Table 2 and 4: Specify whether the GPM and model averages are collocated with the stations.

Table 3: Specify the time interval and number of data points used for the comparison between products.

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