

Review of ‘Impact of Multiple Radar reflectivity data assimilation on the numerical simulation of a Flash Flood Event during the HyMeX campaign’ by Maiello *et al.*

General comments

The manuscript has been substantially improved and I recommend it to be published once the remaining minor comments here below are addressed.

Specific comments

- Is ‘a non-Gaussian error probability density function’ (ll 74-75) the reason why the ‘simulation’ (l 73) of radar reflectivity is challenging? The authors maybe meant ‘assimilation’ instead of ‘simulation’.
- l 194: Is ‘altitude’ meant here instead of ‘elevation’? I suppose the WRF-3D-Var system does not know about the radar elevation angles, position, etc.
- ll 288-292: The answers of the authors to my previous review partly clarified how the radar data are processed in the assimilation system.

I understand that all radar observations enter the WRF-3D-Var system. Some of them are rejected, I suppose based on observation-minus-guess departures. The outer loop technique allows to increase the amount of assimilated data at each iteration.

Could the authors give an example or order of magnitude of: i) the amount of radar data that enter the 3D-Var system, ii) the fraction of radar data that are rejected, say, at the first iteration and at the last one, respectively? That would show the efficiency of the outer loop technique in assimilating more data and give keys to understand the differences between experiments using this technique or not.

- Seven tables of verification statistics (out of nine in the previous version) are still present in this new version. I leave it to the editor to decide whether it is acceptable or should either be reduced or converted into figures for improved legibility.