Review of the manuscript

„The impact of lightning and radar data assimilation on the performance of very short term rainfall forecasts for two case studies in Italy"

by

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The study discusses the impact of the assimilation of lightning and radar reflectivity data on the performance of very short-range rainfall forecasts for two convective case studies in Italy. They showed that especially the combined assimilation of both observation types has a clear and positive impact on the forecast performance.

The manuscript is interesting and tackles a very important subject, since the forecast of severe precipitation is still a major weakness of current forecast systems. With the supplemental material, the methodology is now described with enough detail. In addition, most of my other comments are discussed in the new manuscript. I am nevertheless still concerned about your coarse vertical resolution. Since I guess that you anyway plan to increase the number of vertical levels in the future, the paper would greatly benefit when you include one first test with a higher horizontal resolution. If the results are similar or the same – fine.

Therefore, I stick to it. A **major revision** is needed before I can suggest the publication of the manuscript.

Comments

- To generalize your results, a simulation with a larger number of vertical levels is needed for at least one of the cases. If it shows the same or similar results, you can be sure that your methodology works as expected.
- The error value of 1 to 3 dBz seems to be too small, making the system very sensitive to the radar data. Especially when combining this with a pure sampling of the radar data sounds dangerous to me. Please explain why you use this error value.
- You mention in the new manuscript that it is a limitation of the current manuscript that the R10 run is not updated after the acquisition of new data. True, but this needs to be quantified in a way. Depending on the situation, it is well possible that your very short forecasts are not influenced by this weakness. But it is necessary to show it.
- The readability of the original proposal was better. Therefore, the English needs considerable improvement before the manuscript can be accepted.