

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
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Comment on hess-2021-34

Anonymous Referee #2

Referee comment on "Evaluation of Integrated Nowcasting through Comprehensive Analysis (INCA) precipitation analysis using a dense rain-gauge network in southeastern Austria" by Esmail Ghaemi et al., Hydrol. Earth Syst. Sci. Discuss.,
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In this study, the authors evaluate the INCA precipitation product in southeast Austria. They used the gridded dataset of the WegenerNet dense rain gauge network for the period 2007-2018 as true precipitation. The evaluation is based on four comparisons between the two datasets, and three detection metrics.

Overall, I found this manuscript of quality. The aim of the study is concise, the results are clearly presented. The manuscript reads well and grammatically correct. The findings are clearly presented, and the Discussion provides useful insights into their findings. I consider this manuscript as a valuable contribution and I commend the authors for their work. In my opinion, this manuscript could be published after a minor revision and would be of interest to the readers of HESS.

The main comment relates to the WegenerNet's level 2 data used as reference. This dataset seems to be an interpolation simply based on inverse distance weighting, while the INCA dataset takes into account an external trend caused by topography. I imagine topography plays an important role for the spatial distribution of the rainfall in Austria, why is this not accounted for in the WegenerNet's level 2 data? This is an important point that should be clarified in the manuscript. How does it impact your comparison and the results? Could the INCA dataset be potentially more accurate because of its account of local topography? This needs to be discussed in the revision because this may have a major impact on the findings.

Another comment relates to the relatively small area used for analysis of the INCA. How does this apply to the whole of Austria, or even the rest of southeast Austria? I imagine that the INCA dataset is more precise in some areas than in others. For example, the study area is relatively far from the closest radar station used in the radar-gauge merging

procedure of INCA. How many rain gauges have been used for the radar-gauge merging of INCA? Where are these gauges located? Is the study area a particularly well- or poorly-covered area, relative to the rest of Austria? All in all, my comment relates to the possibility of extending the results found in this study to the remaining of the INCA dataset for Austria. Do the results of this study apply only to southeast Austria?

Minor comments:

- 46: consider rephrasing to “a spatially dense...”.
- 65-66: I found this sentence confusing: “using gridded precipitation fields from the dense WegenerNet weather and climate station” given that the WegenerNet data is not a grid but a set of point measurements with a nearly perfect spatial coverage over the area. This sentence, to me, reads as if you compare an interpolated field with another interpolated field. In Section 2.1 it is made clear that WegenerNet is not an interpolated field, so it would be wise to avoid this confusion in the Introduction of the manuscript. Sentence at L. 93 is also confusing for the same reason. AHA I now understand from L. 97 that this is indeed a gridded dataset! Might be good to reformulate the previous text on it, to let the reader know that you use the gridded data of the WegenerNet dataset.
- 166-167: aggregated with the sum or mean?
- 224: model performance?

Table 1: as a side note, these indices can be summarized into a single diagram called the target diagram. It would have been useful to have such visualization. Note that this is just a comment, but I do not ask the authors to do it for this manuscript.