

1 Reviewer #1

I have only a few minor comments; if these are taken into account, the publication can be published: *Thank you very much for the additional feedback. Below we address, how we have integrated the remaining comments. The line numbers refer to the revised manuscript.*

- Page 7 Line 174: "vertically integrated liquid(VIL)" If you show an figure, something should be said about it in the text (otherwise you can skip the figure).
We added an additional description in the text: "We can also see that VIL is elevated in the area of highest reflectivity, but not extremely high. This indicates significant precipitation, but not necessarily hail. The proximity to the radar may lead to an underestimation of VIL, as the upper part of the storm is above the highest radar beam." (lines 182ff)
- Page 7 Line 173ff: Figure shows... Text suggestion (with some deletions): "Figure 2 shows the radar reflectivity, Doppler velocity and vertically integrated liquid (VIL) measured from Monte Lema radar (marked with A in Fig. 1) at 17:30 UTC on August 20th, 2019."
We replaced the initial phrasing with the suggested sentence (line 173f).
- Page 11 Line 265f: "Westerly flow is the most common flow situation in Switzerland (MeteoSwiss, 2018b)" Theoretically, you also show this in your own Figure 5b (even if only for 5 years). I would include the link here in addition to the citation.
We added a reference to Figure 5b here as well (line 270f).
- Figure 5c If you have nothing to say about Figure 5c, then it is unnecessary for the publication. But if it is important to you, then write 1 or 2 sentences about it in the text.
Figure 5c was described in two instances, where we now added explicit references to the Figure (lines 257, 269).
- Page 14 Line 310f: "At any given location" Not quite clear to me, please rewrite or specify.
We rephrased the sentence to the following: "Storms with weak rotation occur throughout the entire domain and dominate the intensity distribution, ..." (line 315f)

2 Reviewer #2

Overall, the manuscript largely improved after revision.

We would like to thank you for the additional comments. Below we show how we implemented the suggestions. All line numbers refer to the revised manuscript.

Technical corrections:

- L. 216: ...clearly see that more thunderstorms are detected in locations where the quality index is high.
We implemented the suggestion in the text (line 205f).
- L.217-220: Both sentences apply at the same time? The underestimation of thunderstorm occurrence with low quality index AND the consistency of the results with thunderstorm frequencies derived from lightning measurements?
Indeed both sentences apply at the same time. The decrease of thunderstorms in the central Alps is a true meteorological trend and potentially exacerbated by underestimation. However there are areas, where the reduced quality leads to a clear underestimation, e.g. over the Jura, where beam blockage is an issue. We added the following paragraph to clarify this:
"While we may underestimate thunderstorm occurrence in the inner Alpine regions, where the quality index is lower, the reduced convective activity here is confirmed by independent lightning climatologies (Enno et al., 2020; MeteoSwiss, 2016). Moreover, the spatial patterns do not significantly change in the vicinity of the Alpine radars Plaine Morte and Weissfluh, where the quality index is higher." (lines 211ff)
- L.250: Did you match detected mesocyclones with observed hail or is this assumed statistical relationship?
We refer here to a qualitative comparison with hail climatologies. The sentence has been rephrased as follows: "The spatial overlap of the strongest rotation concurring with the largest size hail in the Napf region and Southern Ticino established in longer-term hail climatologies ..." (lines 240f)
- L. 313: See previous question.
As stated above, we refer to a comparison with another study. We modified the sentence to: "Due to the significant drop in convective activity at this time of day, this indicates a significant overlap between mesocyclones identified here and hailstorms analyzed in Nisi et al. (2018)." (lines 298ff)
In our ongoing work on mesocyclone detection in Switzerland, we have identified that the vast majority of mesocyclones are hailstorms (>90 %). However this was derived from a slightly different dataset and is thus not really compatible with the data presented here.
- L.311: "very small sample size": mentioned explicit numbers (<10).
We added this to the text in line 297.