The manuscript “A high-resolution gridded dataset of daily temperature and precipitation records (1980 – 2018) for Trentino – South Tyrol (northeastern Italian Alps)” submitted by Crespi et al., presents a novel and well prepared precipitation and temperature gridded dataset for the Region Trentino-South Tyrol in North-East Italy. The main strengths of the dataset in comparison to previous works are the spatial resolution, the temporal extension up to 2018 and the aim of the authors of keeping it up to date.

I did not find particular issues in the proposed methodology and the dataset is publicly available. I consider therefor the work of interest for the readers of the journal and useful for the scientific community. Some minor comments and suggestions are listed below:

We gratefully thank the reviewer for appreciating our work on the presented dataset and remarking the interest of the manuscript for the readers. We address the minor comments and suggestions here below and they can be integrated, accordingly, in a revised version of the manuscript.

1. Some more information (e.g., resolution, accuracy, measurement error) about the quality of measured temperature and precipitation time series would be important to better appreciate the quality of the interpolated results. In fact, it seems that the interpolation error is in the same order of the measurement error, which is a nice attribute of the dataset.

The weather station measurements are affected by a number of both systematic and random errors, also depending on the type of instrumentation and the way measurements are recorded, i.e. manually or automatically. We have already mentioned in the submitted manuscript (lines 272-275) the fact that rain gauges are usually affected by systematic underestimation of precipitation, which can be larger in case of snowfall and could account for up to several tens of percent of the measured values, especially at the high-level sites characterized by higher wind speed. Due to the different data sources, different instruments and measurement protocols of the collected database, it is not possible to generalize the information on temperature and precipitation measurement errors. Nevertheless, we can improve the details on the collected data by retrieving some information from the data providers to integrate in the Section 2.2, such as for example measurement accuracy of the deployed weather stations. In addition, we can add in a revised version of the manuscript the results we obtained in the quality-check process where we simulated each measured series by using the surrounding stations and an anomaly-based scheme (lines 154-155). The comparison of simulated and measured data allowed us to highlight those series affected by the largest uncertainty but also to get a measure of the general accuracy of the records.

2. I did not get why the dataset was compared with snow-cover maps instead of (for example) other gridded products (e.g., Adler et al., 2015) or remote sensing products. P and T datasets for large parts of the region in fact were investigated in recent works such as:

Mei, Y., Anagnostou, E.N., Nikolopoulos, E.I., Borga, M., 2014. Error analysis of satellite precipitation products in mountainous basins. J. Hydrometeorol. 15, 1778–1793.

Duan, Z., Liu, J.Z., Tuo, Y., Chiogna, G., Disse, M., 2016. Evaluation of eight high spatial resolution gridded precipitation products in Adige Basin (Italy) at multiple temporal and spatial scales. Sci. Total Environ

Maybe the authors could better justify this choice and/or they may find these references useful for section 2.1.

The aim of the comparison was not to further validate the accuracy of the gridded temperature and precipitation products but to show an example of their application in combination with another parameter, for instance snow cover, derived from remotely-sensed measurements at a very fine spatial resolution. We can improve on describing our motivation for this comparison in the manuscript. The inter-comparison with other existing and coarser resolution products, such as the ones analyzed in the suggested references, would be of high interest but it requires a much more extended evaluation and discussion which likely goes beyond the scope of the current manuscript proposed as data paper. The dataset evaluation in an integrated inter-comparison analysis with a pool of rain-gauge and satellite-based products over the study area can be addressed in a future study and this can be explicitly stated in the conclusions. We therefore found the references suggested by the reviewer very useful and we can integrate them in the list of previous studies and available datasets covering the region reported in the Introduction (Section 1).

3. Line 71 please specify which local gradients you mean

We can specify “local climate gradients”.

4. Lines 113-116 since the focus is on precipitation and temperature, and the area investigated is larger than the Adige basin itself, I think these lines could be removed.

We agree with the reviewer and the lines can be removed in a revised version of the manuscript.

5. The correction of 48 precipitation time series gives a particular relevance of this step to the entire process, in my view. Some more information about how the correction factors were applied from monthly to daily time series and how large were the applied adjustments would be interesting.

The adjustment of precipitation data is multiplicative and the monthly factors were directly applied to the corresponding daily values. The homogenization of temperature series was performed by additive corrections. In this case, the 12 monthly factors estimated from the monthly temperature series for the tested period were then interpolated to a daily resolution by means of a second-order trigonometric regression in order to account for the annual seasonality and to obtain an additive correction for each calendar day. As requested by the reviewer, we can improve the description of the homogenization procedure in Section 2.2 in a revised version of the manuscript. In particular, we can better explain how the monthly corrections were computed and how they were transferred to the daily series. In addition to the technical details, we can also report the number of detected breaks and the mean magnitude of the adjustments performed on precipitation and temperature series.

6. I suggest to improve figure 3 providing also information about the relative areal contribution of each elevation range. For example, a second x-axis with the cumulative area of the studied region.

We thank the reviewer for this useful suggestion. We can modify Figure 3 by adding the comparison of the relative elevation distribution of the DEM for the study region.

7. Sections 2.3.1 and 2.3.2 are a bit difficult to follow. I understand that providing too much mathematical details in the main text would make it probably too long, but in my view an appendix with a more rigorous description of the procedure would be beneficial.

Since the methodology description and the dataset evaluation are the focus of the manuscript, we would prefer not to move any text related to the method from these sections to an appendix. However, we can make the section 2.3 clearer and improve here the methodology description as requested by the reviewer.

8. Figure 5, the color-code to interpret the heat map is missing.

We can add the color legend in Figure 5.