Earth Syst. Sci. Data Discuss., referee comment RC2
https://doi.org/10.5194/essd-2021-3-RC2, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on essd-2021-3

Anonymous Referee #2

Referee comment on "A year of attenuation data from a commercial dual-polarized duplex microwave link with concurrent disdrometer, rain gauge, and weather observations" by Anna Špačková et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2021-3-RC2, 2021

On “One year of attenuation data from a commercial dual-polarized duplex microwave link with concurrent disdrometer, rain gauge and weather observations” by SpaÄ□ková et al.

In this paper, the author presents a dataset of microwave signal attenuation of a 38-GHz dual-polarized commercial microwave link (CML). The dataset was collected in the context of a one-year-long field campaign and is supplemented with the data of five laser optical disdrometers and three standard tipping bucket rain gauges under the path of the microwave link. In addition, further meteorological data from five synoptic weather stations is given.

General Comment

As a whole would rate the datapaper as good and support to publish it with some revisions.

The dataset by itself is definitely unique and can serve as a basis for further studies on different issues dealing with quantitative precipitation estimation with the use of CML. On the one hand it is the availability at all, since CML data is often not openly a not available. On the other hand, it is the extend of the data. This holds true for the long-time span of the dataset (one year) of the CML data and also for the collocated data. Next to standard rain gauge and further (synoptic) meteorological data (temperature, humidity, wind and pressure), information of the real drop size distributions is given via the output of five

laser optical disdrometers. To sum it up: with this dataset further detailed studies in the evolving field of QPE using CML are made possible.

The presentation of the dataset is generally good. The structure is clear and the data is easy to access. It is possible to find the data one is looking for, to download the data and to work with the data. The data format and the internal structure within the specific datasets is straight. Further on an overview is given by a HTML viewer, which is also easy to access and leads – via the color coding of the different dates based on the precipitation amount - to the – for the majority of the users - more interesting days with higher precipitation amounts.

Nevertheless, there are some – in my opinion – important points, which need a deeper revision.

The two most important point deals with (a) the metadata of the different sensors and stations and (b) a deeper discussion of the data quality. The metadata being one of the most important parts of a dataset, since they enables the future user to get a bit more insights to the situation the data was gathered or – to put it in other words – to comprehend the whole story a bit more. "*Metadata are especially important for elements which are particularly sensitive to exposure, such as precipitation, wind and temperature*" (Burt, 2012). In this paper and dataset, the metadata, as well as the discussion of the different data quality issues come – in my opinion – a bit very short. I couldn't find detailed information about the different measurement sites. Generally: For every site an own somehow detailed metadata-sheet (as recommended by the WMO and is the best practice in meteorological measurements) is needed, which should – next to a description of the site and the exposure, the specific instruments in use- also include a couple of photos and a more detailed map. I also would recommend a maintenance plan with information what was done during maintenance.

In addition - regarding the different senors / instruments:

For the disdrometers it would be important to know to which direction each was aligned to, since – because of the construction of the Parsivel laser optical disdrometers precipitation coming from the side is a bit more undisturbed. A short discussion of each disdrometer site with respect to possible wind influences would come handy as well as information of a change of the surrounding (especially trees and bushes) over the course of the year.

For the rain gauges a short discussion on possible wind influences and possible change of the surroundings is also recommendend warmly.

For the CML the information about the height above the ground is missing and of high

importance for the use of the data for further studies.

For the airport weather stations and meteo swiss weather stations a short description (list) of the different devices (sensor type, manufacturer, model) is needed in order to generally reproduce the measurements and gain information about the measuring principle. For the airport weather stations it is also important to know, whether the international measuring standards are met.

The second point which needs a more detailed description, and is so far a bit short.

This point goes a little bit hand in hand with the more detailed metadata and is partly accounted for, when one puts down more detailed metadata (for example a short discussion of the exposure of each site). But one further point is the need to clearly explain, how often the instruments were maintained and what was done during maintenance. For the disdrometers it is for example interesting to know, how possible cob webs were dealt with. For the rain gauge it is important to know, whether wind protection shields were used, or what was done during snow.

Burt, S., 2012: *The weather observer's handbook,* Cambridge University Press, Cambridge, 444 p.

Detailed comments:

p.1 l.4: … CML of 1.85 km at a high temporal resolution --- CML of 1.85 km path length at a high …

p.1 l.6: delete ‘effortlessly’

p.1. l. 7: satisfactory to what? Be a bit more precise. Especially state, whether it is reliable.

p.3. l.66: Formula (4): Give a reference, where the formula comes from. There are some a little bit different moments of the DSD for the rain rate circulating in the literature.

- 3 l. 73: Five laser optical disdrometers.

p.3 l. 76. ‘intergrated’, this verb seems in this context a bit not best expression. Just writ, that three tipping bucket rain gauges were used.

p.4. Figure 1: Give an explanation to the abbreviations: P and RG.

p.4 l. 86 ff: Section 2.3. use a subsection for each instrument and – as stated – give a link to the specific metadata sheets

p.4 l. 87 ff: CML- as already written – the height above ground is a needed information.

- 5. l. 96. – laser optical disdrometer

p.6. l. 1. Table 1: I think it is just the location of the sites, which is stated, not the characteristics

- 6. l.111 ff ‘located 6 to 10 km from the experimental site’ Be more precise, give the exact distances and directions.
- 6. l. 116 ff think this is a good place to state, that the tie stamp is UTC (not just in the Appendix).
- 7. l. 121 ff: in the Parsivel dataset there are 20 variables. Some (esp. “Precipitation code 4680", "Precipitation code 4677") need more explanation and in the “read me file” no units are given. I think this should be changed.

p.8. Figure 3. X axis label / time stamp label should be time of the day and there should be a tie stamp (UTC) – This concerns also the other figures and especially the figures accessed via the html viewer.

- 8. l. 135 ff: ‘all major weather characteristics’ is absolutely not the right term. Better use for example standard meteorological parameters.
- 8. l. 137: As stated in the general comment section: The discussion of the data quality is partly a bit to common. What about the standard issues of rain gauge and disdrometer measurements regarding the wind influence and dirt (and cob webs) and snow.

p.9. l.142 ff. There is somehow a duplication of the description, please check this. I was a bit confused.

- 11. Table 4. Be a bit more precise in the label of the table.
- 12. l. 178: has helped develop or could provide – a little bit confusing sentence.

p.12. l.179. font size of subsection caption is bigger that the one of the (main-)section.

-- Section 4 – In my opinion it is a bit to extensive, since it is mostly hypothetic. It is more extensive than the discussion of the data quality and the variable description. This is not the right relation for a data paper. In this way it kind of degrades the more important sections, which are on the other hand a bit short.

Final remarks:

The comments should not hide the fact that the paper is a good data publication. The data are of high scientific interest and the data availability and quality appear to be very good. The paper has also been written in an appealingly clear manner. However, some important points should be changed or expanded in order to provide the best possible basis for future users of the data. What is meant above all is a significant expansion of the metadata and a more detailed discussion of the data quality.