

Dear Editor,

Unfortunately, we did not see your comments when they were originally posted in the manuscript center online. I just checked all my emails from Copernicus and it seems that we never received an email prompting us that Editor comments were posted that require any action from us, not even mentioned when we were asked to respond to the Referee comments. It would be helpful in the future to specifically inform the authors in the case the Editor also posts comments for the authors to respond to, instead of only including the standard sentence in every Copernicus email that article progress can be followed by looking at the timeline of manuscript processing online.

Below, please find our replies to the Editor's comments. We enclose point-by-point responses to the comments, including line numbers that indicate changes in the revised manuscript. Additions and modifications to the previous manuscript in response to the comments from the Referees are also highlighted by blue text in the marked-up .pdf version of the revised manuscript. Minor modifications that were made throughout the text to maintain consistency are not highlighted.

With best regards,

Mathias Gergely, Maximilian Schaper, Matthias Toussaint, Michael Frech

Editor:

- Case studies:

- please provide exact date and time of the birdbath scans analyzed in the 5 case studies which are presented in the manuscript. This is a basic requirement for making reproducibility possible (e.g., simulation of the case studies with models). You would just have to replace your statements "in MONTH YEAR" by "on DAY MONTH YEAR, xx:xx UTC" (or provide a time span, if more appropriate).

Authors:

Following the Editor's request, the UTC timestamp of each analyzed birdbath scan is now included in the corresponding figure captions (Figs. 1, 8, 10, 11, 12) in the revised manuscript.

- 2) 'polarimetric variables':

- This term appears several times in the manuscript. I suggest to be more specific, as it is usually referred to the H-V-ratio (difference in log-space). If you want to continue to use 'polarimetric variables', provide a thorough introduction of this term at the beginning of the methods section.

- Please, also provide a statement why the standard polarimetric variables such as ZDR or RHO_HV are not suited for the presented filtering approach.

- Associated to this statement, also the legend of Figs. 3 and 4 are misleading. 'Difference' should be replaced by a more specific term from which the source of data can be inferred.

- In this manuscript, the term 'polarimetric variables' only refers to the standard polarimetric variables like ZDR and RHO_HV, see the Introduction section. There is no instance where the commonly used term of 'polarimetric variables' refers to the 'polarimetric parameters' that we introduce specifically for our spectral filter.

In the revised manuscript, these polarimetric parameters are introduced in more detail and similarities and differences to commonly defined polarimetric variables and their usage in previously developed spectral filters are given in l. 172ff and l. 178ff.

- The plotted parameters are specified in the caption right underneath the figures and defined in the referenced text section. In the revised manuscript, the plotted power difference of h and v polarization channels is now also specified as x-axis label.

- 3) Data availability:

- Please try to follow the guidelines given here: <https://www.atmospheric-measurement-techniques.net/submission.html#manuscriptcomposition> --> "prepare your assets"

- If you cannot provide data FAIR, you are requested to provide a reasoning why you cannot do so (e.g, perhaps regulations by DWD?)

Very unfortunate choice of acronym and wording in this comment. Nevertheless, in the short-term, data can only be provided by contacting DWD, as stated in the manuscript. In the medium- to long-term, depending on the interest in birdbath moment data and Doppler spectra outside DWD, birdbath scans may be added to a publicly accessible DWD data server.

A comment was added in the data availability section that data is made available in accordance with DWD regulations.

- 4) Typos & Minor:

- general usage of 'remit': Are you sure that this is the right term for a radar-related publication? I could not find any literature source using this word in radiative transfer. It seems to be a financial term.

Actually, the verb 'remit' and the associated noun 'remission' are common terms in radiative transfer, particularly for visible and NIR light. There is even an entire field of research named 'remission spectroscopy'. 'Remit' merely means sending back electromagnetic radiation (as opposed to transmit and absorb), while not making any implications about the physical process responsible for sending back the radiation (e.g., reflect is often misunderstood to imply specular reflections and scattering also has an

inherent physical connotation). Although maybe not common in radar literature, 'remit' is an appropriate description. Therefore we maintain our usage of 'remit'.

- Line 51: better use 'along the line of sight of' instead of 'toward'

Modified in the text as suggested in l. 51.

- Line 69: "birdbath" instead of "birdbatch"

Corrected.

- Line 92: Please provide the coordinates of MOHp. Please also provide the coordinates and altitude of the other investigated sites.

In the revised manuscript, latitude, longitude and altitude are provided for all 5 investigated radars. See l. 93, 389, 455, 479f, 513.

- Line 235: "weather"

Corrected.

- Line 266: Doppler spectrum of which parameter?

As stated in the first sentence of this section, the described analysis procedure is applied to every Doppler spectrum of the isolated weather signal. In the revised manuscript, the weather signal is extracted in the previous section 2.2 and specified as the 'profile of mean Doppler spectra in the H polarization channel and shown in Fig. 5a' (l. 247 f.), which is the sole basis for all further analysis. No other parameters are analyzed once the weather signal is isolated, which should become even clearer in the revised manuscript.

- Fig. 4: The values B1,B2, C1,C2 should be shown in the Figure and be mentioned in the caption.

There is no B2. C1, C2, and B1 are included in Fig. 4 of the revised manuscript and mentioned in the figure caption, as suggested.

- Fig. 6: The legend of Fig. 6a is incomplete (green and orange dots and lines)

There is no need to clutter up the figure by including every color in the legend separately. What matters is the specification of the different marker symbols that indicate the same modal properties for different colors. The meaning of the colors is already included in the caption right underneath the figure, 'Different colors in panel (a) indicate different precipitation modes'. A more detailed discussion is provided in the text passage where the figure is referenced.