

Earth Syst. Sci. Data Discuss., referee comment RC2
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Comment on **essd-2021-265**

Anonymous Referee #2

Referee comment on "EUREC⁴A's *Maria S. Merian* ship-based cloud and micro rain radar observations of clouds and precipitation" by Claudia Acquistapace et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-265-RC2>, 2021

Acquistapace et al. describe in this paper the deployment, operation and data processing of two radar systems (W-band cloud radar and micro rain radar) on the research vessel *Maria S. Merian* during the EUREC4A campaign in early 2020. They describe the setup of the radars on a stabilization platform and the correction of measured Doppler velocities, both for times when the stabilization platform was operational and when it was stuck in an arbitrary position.

The manuscript is well written and clearly structured. The data set is easily accessible.

I have a some comments and would recommend publication after addressing those.

General comments regarding the data:

It would be nice, if the data for ship motion was published along with the latest version of the radar data. Now, users have to access different data sets. And this also adds the danger of possibly using outdated radar data that are published along with the ship motion data (<https://doi.org/10.25326/156>) and could confuse some users.

Is there a way to access ship location information to use together with the hourly data? What would users need to do if they want to know where the *Maria S. Merian* was located for a specific hourly data file?

Specific comments regarding the manuscript:

Figure 3: it is a bit unclear to me, what this figure should convey. The processing steps that are shown in the figure are not easily understandable by just looking at it. A lot of

necessary information is given in the figure caption. One could think about adding these additional information from the caption also into the figure itself. The order in which the steps are mentioned in the caption does not match the order in the figure. I would suggest to either expand this figure a bit so that the processing steps are understandable by only looking at the figure or to remove the figure and expand the respective text section to thoroughly explain the processing steps. In the current state, the processing is a bit hard to follow between the figure, the caption and the text.

Line 157: "computer in a sealed container", what is the meaning behind this? What does the computer do? Is the information necessary? Also, does it have any impact that the container is sealed?

Section 2.3: What are the limits of the stabilization platform compensation? I.e. maximum roll and pitch angles that can be compensated? Was this relevant during this campaign?

Figure 5: this figure is hard to read in the current state. The ship's drawing in the background distracts from the coordinate axes plotted on top and is not necessary to understand the different rotation angles when the figure is first mentioned. I understand, that this figure is referenced later as well as an example on how the coordinate system is defined with respect to the ship. Could this figure be split into two figures for the different purposes?

Line 193: "... time lag ΔT that varies with time between 1 and 4 s" is the variation systematic (e.g. linear increase over the measurement duration)? Or are these random variations?

Line 214 and following: was the time correction done for each time step individually or was this applied to longer intervals?

Line 373: "... cloud system identifiable as a flower type ..." It might be helpful for the reader to add a reference describing the different cloud organization names here.

Line 513: what is psi? If this is the yaw angle and the difference between psi and heading can be something other than zero, I don't understand why heading and yaw are used interchangeably in other parts of the manuscript (e.g. l167 (p9, second paragraph, third line), l523).

Line 547, line 552: what is t_{fin} ? Should it be t_{final} ?

Figure A1: The vertical lines in A) and B) are only barely discernible or not at all. Maybe using another colormap (something like the ones used for the other figures in the manuscript) would help? The authors switch between lower case and upper case letters for the different figure parts between the figure itself and the figure caption and even within the figure caption.

Technical corrections

Line 8: hydrometeors -> hydrometeor

Line 33: time -> temporal

Line 35: setup -> setups

Line 127: add lat, lon as coordinates to the text

Line 188: I don't understand the use of the word "preliminary" here.

Line 475: "in agreement with what reported in" -> "in agreement with what was reported in"

Table 3: unit [deg C] not italic