The authors would like to thank both reviewers for their insightful comments and for taking the time to report the many small typos which were unfortunately not caught by the author team. A point by point responds to the reviewer's comments can be found below.

Reviewer 2

General comments:

1. I think the conclusion about the KaSACR2 precipitation rate would be more convincing if the paper shows some statistical analysis for a longer time period in addition to the theoretical sensitivity curve (Figure 9c) and one snapshot (Figure 7). Some further statistics would also help us better understand the bias of the KaSACR2 precipitation rate for marine boundary layer cloud regime.

We agree with the reviewer that a larger dataset would help further determine the potential of the KaSACR2 for precipitation characterization. However, here where both KaSACR2 and XSAPR2 observations were collected, we want to make the point that, simply from the standpoint of the radar specification, the XSAPR2 system is much more suited for precipitation studies:

"Now constrasting the two scanning radar XSAPR2 and KaSACR2. Although the Ka-band SACR2 experiences less sea-clutter than the X-band SAPR2, because of needs for cloud sampling, it only currently performs one PPI scan at 0.5° every 15 min which limits its temporal resolution. In addition, based on their technical specifications (Table 1), the XSAPR2 single pulse radar sensitivity is approximately 10 dB higher than that of the KaSACR2 (Fig. 9c blue and black line respectively). Finally, the Ka-band SACR2 also suffer from significantly more attenuation from atmospheric gases (Fig. 9c green line) and liquid water which even if corrected for still decrease it's "realized" sensitivity. For all these reasons, we conclude that the XSAPR2 is more suitable for characterizing light precipitation variability over large domains."

We made sure to revise our final conclusions specifying that those apply to the XSAPR2 and not the KaSACR2:

" 5) Shorter term domain precipitation rate variability can only be capture by scanning precipitation radars and especially those operating at weakly-attenuating frequencies and with high sensitivity such as the XSAPR2

6) Scanning sensors such as the XSAPR2 are also better suited to document sporadic and horizontal homogeneous precipitation including precipitation presenting mesoscale organization."

2. It is not clear to me what time period, what weather conditions, and how many data samples are included in the analyses of Section 7.

We agree with the reviewer that it would be appropriate the restate the size of our dataset as it is relevant to the analysis of Section 7. We now specified in Section 7: "Over the 3-month period between 01/10/2018 and 04/01/2018, the domain representativeness of KAZR2 precipitation rate estimates is evaluated using XSAPR2 observations collected over a domain of 40 km radius around the site.”.

3. This paper uses the XSAPR2 precipitation rate over a domain of 40 km radius around the site at 1◦ elevation and the KAZR2 precipitation rate at 200m above the surface to estimate the representativeness of zenith radar retrieved precipitation rate (Section 7). We know that the altitude of the XSAPR2 measurement increases with distance away from the radar (Figure 9a); and the XSAPR2 precipitation rate includes both horizontal and vertical variability (Figure 8), especially the vertical variability of the precipitation rate is pretty large in marine boundary layer cloud regime (e.g. Figure 5a). Therefore, this comparison is not just temporal vs. horizontal precipitation variability. I was not sure how to explain the convergence of these precipitation estimates at 12h and longer time scales shown in Figure 10. The paper demonstrates a gridded domain precipitation rate produce reconstructed from the XSAPR2 measurement in section 6 (Figure 9b). I wonder why this paper doesn’t use the gridded data to estimate the representativeness of zenith radar retrieved precipitation rate. Also, I’d suggest the authors calculate the correlation coefficient between these two precipitation estimates, which provides more information about the relationship between these two precipitation estimates.

The reviewer’s comment is a very good one. To this effect, we recomputed the pdfs using XSAPR2 500 m CAPPI precipitation rates and KAZR2 500 m precipitation rates and now report the correlation coefficient between the two. While the results differ somewhat, our conclusions change very little. Please find below our revisions of this section of the manuscript:

“Over the 3-month period between 01/10/2018 and 04/01/2018, the domain representativeness of KAZR2 precipitation rate estimates is evaluated using XSAPR2 observations collected over a domain of 40 km radius around the site. Although any height could be used, we perform this comparison at the specific height of 500 m; While KAZR2 precipitation retrievals can be directly extracted at 500 m, those from XSAPR2 must be extracted from gridded CAPPI fields which are constructed following the details provided in Section 6 using a collection of PPI scans. […]

Focusing on features such as the width, the minimum, maximum and modes of the precipitation rate statistical distribution; Results indicate that neither 30 min nor 1h averaging of KAZR precipitation rate estimates can be used to replicate the precipitation rate statistics corresponding to those of domain averaged over 30 min (Fig. 10 left column). Averaging of 3 hrs of KAZR2 data improves its representativeness of domain average rain rate variabilities on scales of 1 to 3-hrs (2^{nd} and 3^{rd} rows/3^{rd} column). Convergence between XSAPR2 and KAZR2 precipitation rate estimates is seemingly best when considering the variability of domain-average precipitation rate over 12 h (correlation coefficient R=0.25) or longer timescales; 12-h average domain-average precipitation rate pdf from XSAPR2 and 12-h average precipitation rate pdf from KAZR are similar in both magnitude and mode location.

Although these results are estimated with few observational cases (3-month period), they clearly suggest that XSAPR2 observations are necessary to characterize short-term (< 1 h) domain-average precipitation rate characteristics. They also suggest that longer-term (12 h) domain-average precipitation rate characteristics can be estimated by averaging either XSAPR2 or KAZR2 observations using time-windows of similar lengths.”

"When it comes to capturing the general shape of the precipitation rate distribution, 12-hrs of zenith-pointing radar observations can be averaged to represent the 12-h variability of such a ~40 km radius half circle domain ."

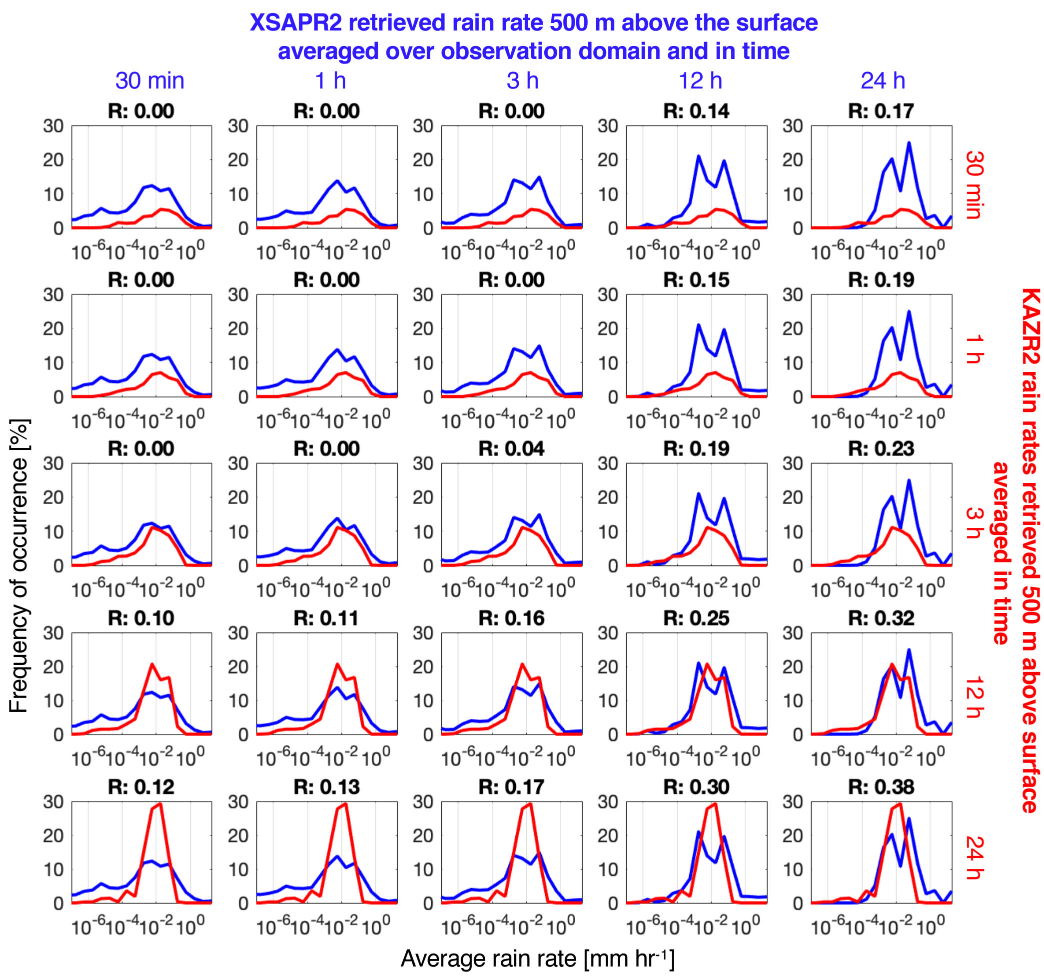

Figure 10. Probability density function of average (over different time windows) precipitation rate as estimated the XSAPR and by the KAZR2 (red) both at 500 m above the surface in $10^{0.5}$ mm hr^{-1} bins; The XSAPR2 precipitation rates 500 m above the surface being from gridded CAPPI constructed using a collection of PPI scans and are limited to the domain between 2.5 and 40 km around the location of the KAZR2. Over each box is the correlation coefficient (R) between the XSAPR2 and the KAZR2 average precipitation rates.

Specific comments:

1. I've noticed some typos scattered throughout the manuscript, so I'd recommend a close readthrough before resubmission.

We would like to apologize to the reviewer for our oversights. We were more careful as we revised the manuscript.

2. Line 59: This sentence (and a few other sentences) should be separated into two sentences.

The sentence was broken down in two and slightly shortened: “Quantification, over a domain of several kilometers, of marine drizzle cell precipitation rate and environmental conditions, could provide additional observational constrains for modeling studies. Unfortunately collecting such observations remain challenging over the ocean.”

3. Line 95: “retrieved” –> “retrieve”

We would like to thank the reviewer for reporting to typo. It was corrected.

4. Line 101: “The ENA” –> “ENA” or “The ENA observatory”

Changed for “The Eastern North Atlantic region”.

5. Line 324-325: This sentence seems unnecessary to me.

The sentence was removed.

6. Line 353: “In additional to” –> “In addition to”

We would like to thank the reviewer for reporting to typo. It was corrected.

7. Line 424: The referred figure jumps from Fig. 6 to Fig. 9.

We apologize to the reviewer for the mix-up in figure references. Figures are now referred to in order and are properly referred to in the text.

8. Line 433-437: The Figure number is wrong (I guess it should be Figure 7).

We apologize to the reviewer for the mix-up in figure references. Figures are now referred to in order and are properly referred to in the text.

9. Line 620: “were showed to” –> “were shown to”

We would like to thank the reviewer for reporting to typo. It was corrected.

10. Figure 4. The red lines in (b) have not been defined in the caption.

We apologize for the oversight. The red lines in b depict the mean and standard deviation. The figure caption was revised accordingly.

11. Figure 5. Can you add the main wind direction on (c) and (d)? It may help us better understand the results from the zenith radar and the scanning radar.

The general wind direction was added using arrows in panels c-d.

12. Figure 6(c). I'm not sure why the solid line (median) is away from the higher frequency of occurrence range (the orange color a = 1.5e2) between z = 0.8km and z = 1.2 km.

We verified and the position of the solid white line reflect the mean of the measurements at each height, the median is to the left of the region with the highest density of points since the distribution is skewed.

13. Figure 7. "The upper panel" –> "The bottom panel"

We would like to thank the reviewer for reporting to typo. It was corrected.

14. Figure 10. The x axis of the subpanels and the caption "precipitation rate estimated in 0.5 mm hr-1 bins between -8 and 0.5 mm hr-1": I don't understand why there are negative precipitation rates in the results.

Rain rate are reported in logarithmic scale and the caption should read "precipitation rate estimated in $10^{0.5}$ mm hr^{-1} bins between 10^{-8} and $10^{0.5}$ mm hr^{-1}." We would like to apologize to the reviewer for the confusion.

15. The paper argues that "forward-simulators should be used to guide high temporal-resolution model evaluation studies" without providing any information about forward-simulators. I would suggest the authors to briefly describe what forward-simulators are and cite a few relevant references.

We agree with the reviewer that additional information is granted, we added to following material to the revised manuscript:

"Factors such as instrument sensitivity, sampling resolution, sampling height and domain size should always be considered when comparing model output to observations. One way to consider these factors could be to convert model output rain rates to observable rain rate through the use of forward simulators which can use drop size and atmospheric conditions information to reproduce the attenuation affecting radar signals. Several forward-simulator further take into consideration the dependency of radar sensitivity with range which dictates the minimum detectable rain rate at various distance within a domain (e.g., Tatarevic et al., 2015; Lamer et al., 2018)."