

Interactive comment on “The Copernicus Surface Velocity Platform drifter with Barometer and Reference Sensor for Temperature (SVP-BRST): Genesis, design, and initial results” by Paul Poli et al.

Anonymous Referee #2

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The submitted paper presents the new generation Copernicus drifting buoy, which has a reference sensor for SST measurements providing more accurate results than standard drifters. The paper is well written and on time for the validation of the SLSTR SST. Thus, it deserves publication in Ocean Science once the following comments are addressed. Although, there is in practice one major comment about the wind speed dependence, which requires a little bit of extra work, this is straightforward and it is not expected to cause difficulties to the authors.

Major comments

1) Page 5, Lines 14-15. Although, the dependence on significant wave height is very interesting and useful, the majority of past SST studies (e.g. Donlon et al. (2002), Morak-Bozzo et al. (2016)) have used the wind speed as the parameter from which the sea-state mixing can be deduced. Thus, it is important to make the link with previous studies and add a panel to Figure 2 of the SST difference against wind speed (e.g. taken from ERA-5) and discuss it in the text.

2) Page 11, Line 7. Similar to the previous comment, add a wind speed panel in Figure 9 and respective discussion in the text.

Minor comments

3) Page 2, Lines 12-15: This sentence is not clear given that AATSR, the precursor of SLSTR, it was also a dual-view radiometer with two on board blackbodies for the calibration of the TIR channels. Please rephrase or clarify.

4) Page 2, Line 20: "... earlier generations of sensors." Please indicate the sensors that are talking about.

5) Page 5, Line 9: "There are fewer ... at night and ...". Please rephrase as it does not make sense.

6) Page 5, Line 12: Please add a comment about the differences at ± 1 K in Figure 2. Also, it is not clear if there are differences larger than ± 1 K or not. Please clarify.

7) Page 6, Line 13: The reference to Table 3 is missing. Probably, it would be better to move the sentence of lines 18-20 a few lines above, as there is reference to Table 3 in line 13, but a description/presentation of Table 3 is introduced below.

8) Page 7, Line 3: It would be useful to add a comment about the above average lifetime of the 3 buoys in Table 3 and also interpret the trends under this light. The drifters have a mean lifetime of ~ 450 days, e.g. Lumpkin et al. (2012).

9) Page 7, Lines 9-10: This sentence is true if the assumptions behind the analysis

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are true. For example the representativity error is not taken into account. Gruber et al. (2016) provide a mathematical framework indicating how triple collocation penalizes the point instrument (in this case the drifters). This is in line also with the results of the authors e.g. in Figure 9d for differences occurring only within 5 minutes for which the percentiles have been calculated.

10) Figures 4 and 5 (or in the text): Please provide the number of match-ups and the step of the SST uncertainty.

11) Page 8, Line 29: Why not the 25 and 75 percentile (instead of 30 and 70) from which the interquartile range (IQR) can be calculated?

Technical comments

12) Is Figure 7 useful?

13) Page 9, Line 20: Probably add the clarification that the drifters have been in the Mediterranean, as it is confusing with the previous sentence.

14) Page 8, Lines 23-24: Deployment in Brest? Please clarify.

15) Page 11, Lines 19 and 21: Change the numeration of the figures, as Figure 13 appears in the text before Figure 12.

Extra references

Donlon, C.J., P.J. Minnett, C. Gentemann, T.J. Nightingale, I.J. Barton, B. Ward, and M.J. Murray, 2002: Toward Improved Validation of Satellite Sea Surface Skin Temperature Measurements for Climate Research. *J. Climate*, 15, 353–369, [https://doi.org/10.1175/1520-0442\(2002\)015<0353:TIVOSS>2.0.CO;2](https://doi.org/10.1175/1520-0442(2002)015<0353:TIVOSS>2.0.CO;2)

Gruber, A, C-H Su, S Zwieback, W Crow, Wouter Dorigo, and W Wagner. 2016. “Recent Advances in (soil Moisture) Triple Collocation Analysis.” *International Journal of Applied Earth Observation and Geoinformation* 45: 200–211.

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Lumpkin, R., N. Maximenko, and M. Pazos, 2012: Evaluating Where and Why Drifters Die. *J. Atmos. Oceanic Technol.*, 29, 300–308, <https://doi.org/10.1175/JTECH-D-11-00100.1>

Interactive comment on *Ocean Sci. Discuss.*, <https://doi.org/10.5194/os-2018-109>, 2018.

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