

# Response to Reviewers

Helene Gloeckner on behalf of the authors

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## 1 Reviewer 1

My main question is whether the distinction between the ITCZ and monsoon trough is important enough here to mention.

We don't think that this distinction would add to the presentation of the data. Based on your comment, we added a clarifying sentence.

**New** Sec. 4 [...] Especially in the East the southerlies turn westward as they cross the equator to form the monsoon trough (Flohn 1951, Praturi and Stevens 2026). This indicates that most of the dropsondes sampled the breadth of the ITCZ by measure of surface wind direction as well as IWV. Sometimes the ITCZ is distinguished from the monsoon trough through its absence of westerlies, a distinction we do not adopt in this paper.

**Old** Especially in the East, the transition from southerlies and northerlies to westerlies is apparent, indicating that most of the dropsondes sampled the breadth of the ITCZ also by this measure. Westerly surface winds in the Eastern Atlantic are in line with the idea of an equatorial westwind zone (Flohn 1951).

**Line 21** Line 21 - wind speed should be wind velocity (it has a direction)

Done.

**Line 27** remove 'more'

Done.

**Line 36** There may have been earlier attempts, such as [https://doi.org/10.1175/1520-0493\(1984\)112<0137:CSOABO>2.0.CO;2](https://doi.org/10.1175/1520-0493(1984)112<0137:CSOABO>2.0.CO;2)

Thank you for pointing out this early and interesting paper. Based on our reading it appears that the convergence measurements are made using flight level data, They do report a dropwindsonde system but its data only seems to be used for constructing the tephigram in their Fig 14.

**Line 146** launch detect occurs whether the parachute opens properly or not. It just states that the launch detect pin has been activated.

We clarified this in the sentence.

**New** [...]which occurs if the sonde **launch detect pin has been activated**~~parachute opens properly~~. The respective "A-file" includes a line stating "Launch Obs Done?" and possible flag values "0" - *False* and "1" - *True*. In case **the parachute**~~it~~ does not open, or the opening is not detected, the sonde does not switch to a high power mode [...]

**Line 162** These sondes could have been processed through aspen with the correct configuration by creating it. This could have an impact on the final wind measurements.

We decided not to manually set up an ASPEN config file in order to stay consistent with earlier datasets (George et al 2021), to clearly separate ASPEN output from custom QC, and to avoid potential sources of error. This reasoning, in our opinion, outweighs any potential information gain on  $w$ , which is not a variable in the main BEACH data levels. We list these sondes in the supplements and added a note that they can be reprocessed to obtain  $w$  if needed.

**New** [...]because ASPEN does not allow a processing with the **default** RD41 configuration for those sondes. While this does not influence the variables used for the BEACH datasets of Level **3**~~2~~ and above, it does impact the estimated vertical wind component included in the Level **1** and **2** datasets of those sondes. The affected sondes are listed in supplement Table E.2 **so that they can be manually reprocessed if needed**.

**Line 181** the sondes are not too heavy to be carried upwards. The sondes are, however, unlikely to be carried upwards in the relatively quiescent environments of this dataset.

We changed the sentence to better reflect that it's valid because our sondes were not carried upward.

**New** [...]because the sondes were not carried upwards in the ORCESTRA measurements ~~are too heavy to be carried upwards~~. [...]

**Lines 196–197** Another important check is whether the vertical velocity is reasonable. Large  $w$  near the surface means the sonde was floating. Was this done? It is unclear whether this is as important with the RD41s as with the NRD41s.

There is a floater test which checks whether the ‘gpsalt’ does not vary by more than 1 m, and pressure does not vary by more than 1 hPa. However, this test does not fail for this dataset and there are no abnormally high vertical velocities close to the ground in level 2 (see Fig. 1).

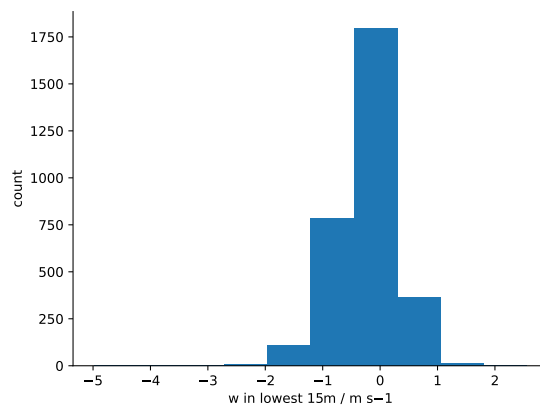


Figure 1:  $w$  values below 15 m histogram.