

## ***Interactive comment on* “Ship- and island-based soundings from the 2016 El Niño Rapid Response (ENRR) field campaign” by Leslie M. Hartten et al.**

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### **Response to Referee #1 of essd-2018-7**

Referee comments are in *italics*; our responses follow each comment.

#### **Referee #1:**

**General comments (excerpt):** *The authors discuss in detail the needs for sounding reprocessing in light of the errors that can be introduced by incorrect ground observations. The paper would benefit if the authors quantified the uncertainties in variables at*

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*the varying processing levels.*

RESPONSE: We have thought long and hard about what exactly Referee #1 desires and how we could accommodate it. Referee #1 appears to be interested in knowing what impact the DigiCORA reprocessing with corrected surface data had on the soundings, and perhaps also in knowing what impact the subsequent ASPEN processing had.

We would first point out that some of the original surface observations were wrong; if we were to compute differences between the in-the-field DigiCORA output and the reprocessed DigiCORA output, we don't see how the resulting statistics would really help other scientists, whose surface data would be wrong in different ways and amounts. It would also be particularly difficult to untangle the effects due to the corrections of surface humidity, surface temperature, and surface pressure.

We would also say that we are curious about the two issues we laid out above (the impact of corrected surface data on the soundings produced by DigiCORA, and the impact of ASPEN processing). However, ENRR's focus was "the tropical atmospheric response to El Niño and the implications for predicting extratropical storms and U.S. West Coast rainfall" (Dole et al. 2018). Our objective was limited to production, publication, and documentation of the best possible Level 2 sounding data sets, by which we mean automated production without either statistical exploration of possible systematic biases or subjective human identification of individual suspicious values. Analysis of the impact of using corrected surface observations, or of the application of automated ASPEN processing after DigiCORA processing, is beyond what we can do.

ACTION TAKEN: Added text to indicate that such an analysis is beyond the scope of our objective, and to point readers to other resources.

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**General comments (excerpt):** *When entering the surface observations of wind speed and direction [during launches from a moving platform] there is debate so to which is more accurate: the raw or those corrected for motion of the platform. The paper would benefit from stating which approach is used and why.*

RESPONSE: The surface wind observations that “anchor” the reprocessed ship soundings are from the corrected surface data set, i.e. they are a corrected version of the true (earth-relative) winds produced by the onboard Science Computer System (SCS). The SCS adjusted the measured winds to account for the ship’s speed over ground, course over ground, and heading; it did not incorporate information about pitch, roll, and yaw.

ACTION TAKEN: We have added a sentence clarifying the earth-relative nature of these surface winds, and another explaining our reason for using them instead of ship-relative winds.

### Specific comments:

**1. Page 4 line 32.** *“, Colorado. . . . . hotel building.” This seems to be a snip-it left over from an edit cut-and-paste. This needs to be cleaned up.*

ACTION TAKEN: Missing text inserted. (Thank you!)

**2. Page 12 line 20.** *The formatting of this line needs addressing.*

RESPONSE: Unfortunately, that formatting is a “feature” of paragraph settings that force justified (flush left and right) text while keeping long web addresses intact. We believe we should leave this alone and let the technical editor decide how to handle it in final publication.

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ACTION TAKEN: None.

**3. Page 13 line 1.** *The authors reference the British Atmospheric Data Centre (BADC). BADC technically no longer exists and has been superseded by the Centre for Environment Data Analysis (CEDA): <http://www.ceda.ac.uk/>. If you are using CEDA as a link to your readers regarding NASA-Ames data format it would be better to put in an explicit link.*

ACTION TAKEN: We have replaced BADC with CEDA and updated the link in the References to point to the NASA-Ames data format landing page.

**4. Page 15 line 13.** *Formatting.*

RESPONSE: We agree that it's ugly but, again, it's what the template formatting does and we think the technical editor should make the call on overruling that template.

ACTION TAKEN: None.

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