

Interactive comment on “The Midlatitude Continental Convective Clouds Experiment (MC3E) sounding network: operations, processing and analysis” by M. P. Jensen et al.

Anonymous Referee #2

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This manuscript describes sounding data collected during a midlatitude convective cloud experiment (in 2011), corrections made to those soundings, and the effect on convective indices. The set of data is new, but the handling of the data collected is not ground breaking research. The bottom line is that this is a readable description of a data set, with minimal scientific description of its usefulness. If that is what AMT is looking for, then it is suitable for publication.

Specific comments:

Figure 2 is unnecessary Question: the text states: “note: as will be discussed in Sect.

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3.1 it was found that the GPS observations induced a dry bias in the corrected humidity profiles, and so we did not use them for scaling)” How do you determine that the GPS introduces a dry bias? Are there other studies that discuss how that may be the case? A study by Wang and Zhang (J. Clim, 2008, DOI: 10.1175/2007JCLI1944.1) found a dry bias in the Vaisala RS 92 relative to GPS PW. How do you determine the absolute accuracy of the PW measurements? It seems that here it is assumed that the Microwave Radiometers are judged to be most accurate. Is that a valid assumption? If so, how is that justified? Figure 3 This figure adds little information to the paper. The caption stations that bars are color coded, but the only color I can see is blue, with some lines thick and others thin). The information may be better conveyed in a table, but really isn’t needed. A sufficient summary is given in the text and in Table 2. Figure 5 would be better displayed as a table than a bar graph. Comment: the paper states: “The SONDEADJUST VAP takes the sounding that has been corrected for known biases and then uses an independent retrieval of PWV to scale the radiosonde water vapor measurements (Turner et al., 2003).

M09 is specific to RS92s. Turner et al. 2003 is for RS80s. For this measurement campaigns my understanding is the RS92 was used. Is the Turner adjustment valid for that? If so, is there a publication that can be referenced? I’m also a bit confused why two corrections are done. My understanding from reading M09 is that the corrections applied improve the PW estimate from the RS92 as compared to the ground based PW measurement. Why is the second correction needed? And, Wang and Zhang, 2008 (see above) note day and night differences with RS92s (in a comparison with GPS PW). Are such corrections applied as well to this data set? (Is that dealt with in the adjustment from a 66 degree SZA?) And, if I’ve understood the text correctly, a single scaling factor is used at all altitudes (over a large range in water vapor content). How is that justified?

The paper has a lot of discussion on how indices are impacted by corrections, but no discussion on whether the corrections produce indices that are more realistic. It

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would be a much more interesting study if it included discussion of whether corrected versions of CAPE from a sounding leads to a better prediction of the convection that actually occurred on the day of the sounding. This would add a bit more science to what is currently a very technical paper.

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