

Interactive comment on “Thermal structure of intense convective clouds derived from GPS radio occultations” by R. Biondi et al.

Anonymous Referee #2

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General comments

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This paper presents an interesting comparison of two independent measurements of deep convection. It should be published after the following concerns have been addressed.

Specific comments

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1) P29097, Sec 2.a.3. More description is needed of the wetPrf data on the CDAAC website. These are the source data for the key results of the paper, on the lapse rates

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within convective clouds. How good are the wetPrf data? What covariances are used? Please provide a reference to some evaluation/validation of this data.

2) P29097, L9. Please provide a better reference to the 1dvar technique in RO, eg Healy and Eyre QJRM 2000, or Palmer et al JGR 2000. (Probably H+E since that's based on refractivity retrievals and I think that's what's used to generate wetPrf.)

3) P29096. Is the given CDAAC URL correct? (It didn't work for me just now.) Why not <http://cdaac-www.cosmic.ucar.edu/cdaac/index.html> (which did)?

4) P29097. Units of T, p and e need to be specified for eqn 3 to be meaningful. Units of N can be inferred from eqn 2, but it wouldn't hurt to spell them out.

5) P29102, L21. "... no significant anomalies above the cloud." It looks to be about 1.5K in Fig 7a, which is about half the peak. Perhaps you could say that the anomalies rapidly die off beyond z-z0=5 for the high cloud top occultations - assuming they do.

6) P29104, L4: suggest replacing "with excellent agreement" with "agree within about 1km".

7) P29109,29110, Figs 2 and 3: the writing on these figures is a bit small on a hardcopy. Please consider redrawing with a bigger font.

Technical corrections

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1) P29099, L14: typo form → from.

2) P29106, L2: typo "theMariner" → "the Mariner".

3) P29106, L4: typo "vapour" → "vapor".

4) P29107, L16: typo "vapour" → "vapor".

5) P29113 Fig 6 caption: do you mean "the green lines are the average +/- one standard deviation"? If not, what do you mean by the "average one standard deviation"?

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6) P29114, Fig 7 caption: ditto.

7) P29116, Fig 9: typo "Inversione" → "Inversion".

8) P29116, Fig 9 caption: suggest replacing "... profile during the convective systems" with "... profile when a convective system is present", which sounds a bit better.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 29093, 2011.