

Interactive comment on “A noniteratiave approach to modelling moist thermodynamics” by Nadya Moisseeva and Roland Stull

Anonymous Referee #2

Received and published: 25 October 2017

This paper presents a technique for calculating temperature or wet bulb potential temperature along moist adiabats. Based on a high-order polynomial fit, the technique is considerably more accurate and less computationally burdensome than the iterative or look-up table procedures that are typically employed in most numerical weather prediction models. The high practical value of this work merits publication in ACP. The paper is well written and the methodology is clearly presented. I've provided a few minor suggestions for improvement below.

Main comments:

1) There are more figures (seven in total) than necessary for a short technical note. Figures 2-5 provide no information beyond the demonstration that the polynomial fits are indistinguishable from the “truth”. The authors could consider removing these fig-

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ures.

2) Some potentially useful context to add to the manuscript would be to address the question of whether errors associated with pre-existing methods are systematic or just noisy. Systematic errors in temperature would result in biased latent heating profiles, which could in turn have dynamical implications on the grid scale. If this were the case, then the improvements offered by the authors' methodology would be more substantial than a simple low-cost noise correction.

Other minor issues:

P1.L20: Spelling error. "improve" P3.L7-8. I don't understand why alternative function fits are "unlikely to be sufficiently accurate to be useful." Why not? What precisely does "well behaved parameters" mean here. The language used in this and the following paragraph is imprecise and the claims sound subjective. P4.L21-22. How much accuracy is compromised if the Table values are used instead of the spreadsheet. Can you put some numbers to this claim. Is the Table even necessary if the authors are cautioning against the implementation of the numbers in the Table? P6.L7-8 and L28-29 and elsewhere there are paragraphs comprised of single sentences. Can these sentences be merged with either the preceding or following paragraphs?

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-624>, 2017.

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