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Atmospheric Measurement Techniques Discussions

Interactive comment on "Vertical Air Motion Retrievals in Deep Convective Clouds using the ARM Scanning Radar Network in Oklahoma during MC3E" *by* Kirk W. North et al.

Anonymous Referee #3

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This manuscript does a nice job of describing how observations from several different scanning radar to estimate vertical air motions. I feel the manuscript needs a couple clarifications before being ready to publish.

Specific comments:

1. Page 4, lines 1-7. The first line of page 4 states, "Data were calibrated and processed according to several standard methods in the literature, . . ." The manuscripts needs to clarify what ARM data are used in this study. Specifically, were the data calibrated and processed by ARM or by the authors of this manuscript. Also, the manuscript should include the DOI numbers of the ARM datasets used in this study and whether or not the data processed by this research team are available for others to

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Discussion paper

analyze. Line 7 on page 4 states that the radar data are mapped to a common Cartesian analysis domain. I thought ARM already produced a radial moments to Cartesian coordinate moments data product. The manuscript needs to clarify whether or not this common Cartesian data is the same or different than an ARM data product.

2. Page 4, lines 15 to 19. The manuscript should state the weights used in this study. As written, the manuscript describes that the weights are important, but not the actual weight values. If this work is to be repeatable by others, then the weights of the gridding should be published in this manuscript.

3. Page 4, lines 1 to 19. The manuscript needs to describe in this section what radar observations are used in this manuscript. With the importance of preserving the phase and amplitude information of the input radar data (see line 19), the reader is led to believe that a phase measurement (e.g., Kdp) is used in this study. But in later pages, it appears that only reflectivity and radial velocity are used in this study.

4. Page 5, line 14. This reviewer noticed the phrase “surface impermeability”. That is a fancy way of saying “surface boundary condition”.

5. Page 5, lines 13-22. I found this section hard to read because the cost function terms are not defined. The manuscript needs to define the cost functions of J0, Jc, Jp, Jb, and Js. As written, these terms are not introduced until subsequent section headings.

6. Page 8, line 25 and onwards. The variable names for the weights are different in the text and in the figures. These different variable names is very confusing for the reader and the manuscript needs to be corrected.

7. Table 2. I found the entries for pulse width and range resolution to be confusing and possibly redundant. The entry for the UAZR range resolution is either 200 meters or 120 meters, not both, please correct or clarify.

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