

Interactive comment on “The Meteorology-Chemistry Interface Processor (MCIP) for the CMAQ modeling system” by T. L. Otte and J. E. Pleim

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We thank the reviewer for the positive and constructive comments on our manuscript. The feedback from the reviewer has improved the quality of the manuscript. The reviewer’s specific comments (shown in *italics*) are addressed below.

This manuscript documents scientific changes and technical upgrades in the MCIP. It seems that some detailed discussions should be included in the MCIP user guide. Thus the paper can be focused on overall design and infrastructure of MCIP.

We agree that there are some details that have been included in the manuscript that
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may be more suitable for a user’s guide than a paper. Unfortunately there is no user’s guide that is specific to MCIP. Keeping both points in mind, we have taken a closer look at the manuscript to remove detail that we believe could be obtained from other sources or that detracted from providing a useful overview of MCIP. For example, in line with comment 3, below, we have followed the reviewer’s suggestion to shorten the discussion of the fields that are required and recommended from the WRF model. We have also shortened the discussion of the windowing options in Sect. 2. Overall, we believe that all of the information is valuable for the user community, and we did not believe that any sections or subsections were worth sacrificing entirely.

1. Page 1485: Figure 1: spell out CMAS. Figure 1 is discussed on page 1451, and the CMAS is spelled out on page 1471.

The figure caption was modified as suggested by the reviewer.

2. State up-front that the WRF model discussed in the manuscript is referred to as WRF-ARW unless WRF-NMM is explicitly stated. Use “ARW” throughout the text, except for the discussions on WRF-NMM.

The first sentence of Sect. 2 (Meteorological input) states, “The community release of MCIP can ingest and process meteorological fields from . . . MM5 . . . and WRF-ARW.” Based on the reviewer’s comment, the second sentence of that paragraph has been clarified, “. . . the community release of MCIP is restricted to using MM5 and WRF-ARW data sets at this time.” The title of Sect. 2.2 has been changed to “Special information for WRF-ARW input”, and the first sentence of that section states, “Here, the linkage in MCIP only refers to the WRF-ARW core; linkage to the WRF-NMM core via MCIP is not a publically available product.” The usages of “WRF” and “WRF model” have been changed to “WRF-ARW” in a handful of other places in the text to improve clarity. We believe that expanding the references to the WRF model as “WRF-ARW” throughout the document is unnecessary.

3. Page 1457, second paragraph in section 2.2. The discussions on required fields (e.g., UST, ALBEDO) and preferable (e.g., LAI, CANWAT) can be summarized.

The text in Sect. 2.2, paragraph 2, was shortened as suggested by the reviewer.

4. Page 1458, lines 13-14: Is the hourly or more frequent model output also required for MM5 setup?

Yes. A sentence was added to Sect. 2.1 to state this requirement: "MM5 output in MMOUT must be captured hourly, at most, because the CTM expects meteorological fields resolved at no coarser than hourly temporal spacing."

5. The authors provide reference to ACM2, but not to other schemes (e.g., NOAH LSM, Ferrier microphysics scheme). The Pleim-Xiu LSM was first mentioned on page 1456, and the reference is cited on page 1467.

References have been added for the NOAH LSM (Chen and Dudhia, 2001) and for the Pleim-Xiu LSM (Xiu and Pleim, 2001) at their first appearances in the text. The reference to Pleim and Xiu (2003) is specifically for the soil moisture nudging scheme and not for the Pleim-Xiu scheme itself. We chose not to add the reference for the Ferrier scheme because it is not compatible with the CTM at this time, so understanding its components would not necessarily be relevant for users of CMAQ.

6. Page 1472, line 17: the authors miss 'to' in the phrase "link another meteorological model CMAQ".

The text was modified as suggested by the reviewer.

7. Page 1480, Table 2: please explain 'dot points' and 'cross points'.

Dot points are cell corners, and cross points are cell centers, as noted in the file descriptions where they are used in Table 2. The caption for Table 2 has been modified to
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include a cross-reference to Fig. 2: "The relative locations of the fields can be obtained from Fig. 2a (dot points and cross points) and Fig. 2b (cell faces and cross points)."

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