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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "A meteorological overview of the MILAGRO field campaigns" *by* J. D. Fast et al.

**J. D. Fast et al.**

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Response to Reviewer #1:

1. I assume that this comment requires no change to the manuscript, since it agrees with our meteorological classification strategy.

2. I understand the reviewer's point; however, the use of "smaller" or "larger" seems awkward when referring to some meteorological parameters. For example, "larger humidities" and "larger temperatures" seems awkward when compared to "higher humidities" and "higher temperatures". I have changed some of the text to "larger" and "smaller" when it seemed appropriate, but the usage of "higher" and "lower" remains in much of the text.

3. The 500 hPa plot was included as the top panel, but the figure caption was incorrect.



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The figure caption has been corrected.

4. Two sentences have been added that quantify the percentage of time favorable for transport from T1 to T2.

5. The figures that appeared on-line were much smaller than intended. The editorial staff indicated that the figures can be enlarged for the revised paper submitted to ACP.

6. Changed “shears” to “profiles” as suggested.

7. Reworded the sentence to emphasize the pressure gradient, rather than just the low-pressure system over the eastern U.S.

8. Symbol size made larger as suggested.

9. I do not agree that more figures relate to Norte 2. Figures 5 and 10 compares Norte 2 and 3 to show that Norte 3 is more potent. The synoptic conditions are only shown for Norte 3 in Figure 6. Since Norte 2 and 3 were only one day apart, Figures 12 , 13, and 15 use Norte 2 to divide the field campaign into 2 periods for clarity purposes.

10. Changed text as suggested.

11. The sentence has been re-worded to clarify.

12. Part of the reason for including Figure 16 is to show how complex the winds can be in the vicinity of Mexico City. The two periods in which the boundary layer winds appear to be coupled to the synoptic winds occur when the dots cluster around the GFS values (line). This is what we wanted to emphasize, rather than explaining the details of what is going on during other periods when the winds were more complex. I do not know how better depict this, so Figure 16 remains unchanged.

13. Yes, I meant 2005. 2004 has been replaced by 2005 in the text. The caption for Figure 17 has also been expanded to include the sub-panels.

14. A schematic diagram that depicts the general thermally-driven flows discussed in



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third paragraph of the introduction has been added as the first figure. The reviewer is correct that the topic will be covered in more detail in forthcoming papers; therefore, a diagram is included here for those readers unfamiliar with the topics discussed in the third paragraph. References to it are also made elsewhere in the text where appropriate.

15. A sentence has been added at the end of Section 8 to mention two papers that I'm aware of that will describe the local and regional meteorology in more detail. The paper already mentions several types of studies that are needed to further analyze the MILAGRO dataset, but I do not think it is necessary to list all possible future papers. Inevitably, someone would be left out. I know how to cite previous published papers, but it is more problematic to cite papers that have not been submitted for publication.

16. Changed the wording of the sentence to state that "mechanical mixing associated with the strongest winds contributed to the near-surface layer". The reviewer is correct that thermal mixing is also important. Since near-neutral conditions were also produced at night, the data suggests that mechanical mixing may be the dominant process. The measurement site is also located within a few kilometers of the ocean. Sea-breezes will prevent well-developed deep convective boundary layers that would occur further inland from Veracruz.

17. A short paragraph was added at the end of section 5 regarding dust. Dust will be an important research topic by itself. Here we document the periods of strong dust events during the field campaign and their association with the local winds.

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 2037, 2007.