Atmospheric
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Discussions

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Interactive comment on "Ozone production and transport over the Amazon Basin during the dry-to-wet and wet-to-dry transition seasons" *by* M. M. Bela et al.

Anonymous Referee #3

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General comments:

This paper discusses ozone data from the BARCA campaign and presents an analysis of how well a regional model can reproduce the observations. This data set provides valuable new information on ozone over the Amazon, and the model evaluation is thorough. The introduction (lines 20-25) sets out 3 science questions that the study aims to address. These are important questions, but at times the text contains so much background and model evaluation that that the main focus gets lost. Overall, the paper presents valuable results but would benefit from better organization around the main science questions. For example, the introduction (Section 1) and Previous stud-

ies (Section 1.3) could be combined and condensed so that they lead directly into the questions this study will address. Stronger links between the model evaluation and the science questions would also be helpful.

Specific Comments:

Abstract Line 15-18: There are a number of reasons ozone might be higher in OMI/MLS than the model besides lack of PBL sensitivity in the satellite data.

P14010 Line 16: Please explain "The flights consisted of quasi-Lagrangian measurement"

P14022 Line 26-28: What is the advantage of using the 16 boxes instead of just sampling the model at the location of the observation?

Section 3.3 1st Paragraph: Is this background information or findings of this study? If it is background, please include citations.

Page 14030 Lines 3-5: The second part of the sentence does not necessarily follow from the first, since there could be errors in the model's vertical distribution of ozone.

P14034 Lines 6-7: Better agreement than what?

P14034 Lines 9-10: Are there other possible sources of model error?

P14034 Line 24: Could insufficient ozone deposition also contribute?

P14035 Lines 1-4: While the lack of surface sensitivity in the satellite data is known and is a potential factor in the model/obs mismatch, there can be many sources of model error. This statement, here and in the abstract, needs to be re-worded; one cannot conclude simply from the fact that simulated ozone was lower than OMI/MLS at mid-levels that the O3 observed by satellites is dominated by the mid-troposphere and long-range transport.

P14025 Lines 5-8: This sentence is confusing. Please re-word.

Figure 2 Caption: What statistical test does Matlab use to determine outliers?

Comments about organization:

P14008 Lines 8-13: This seems like a separate paragraph and should be moved elsewhere.

P14009 Line 15: Description of BARCA seems like it should be a separate paragraph

Are sections 1.1-1.3 all subsections of the introduction?

Section 1.3: This section could potentially be combined with the introduction. It contains a lot of detail on past studies, but it would be helpful to relate this information more strongly to the goals of the current study and how the current study will advance our understanding.

Section 3.2: There is a lot of detail in this section that is difficult for the reader to keep track of and relate to the main chemical processes. The last paragraph provides a nice summary, so perhaps other portions of the text and the number of figures could be reduced. Another possibility would be to combine sections 3.2 and 3.3 but discuss each portion of the campaign separately.