

Interactive comment on “Impact of deep convection on the tropical tropopause layer composition in Equatorial Brazil” by V. Marécal et al.

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General comments:

The authors present a very detailed study of simultaneous observations of carbon monoxide, ozone, and temperature in the tropical tropopause layer and the lower stratosphere over Northeast Brazil. Signatures in the vertical profile of carbon monoxide are used to identify transport of polluted air masses by remote deep convection a couple of days prior to the flight. The manuscript is clearly written and well structured and will be of interest to scientists working on transport processes in the tropical transition layer. I therefore recommend publishing this manuscript in ACP after addressing the com-

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ments below. Please note that all figures in the paper are quite small. Some fonts are nearly unreadable. Hence, figures and/or fonts should be displayed in a larger format for better readability.

Specific comments:

Page 16153, lines 21 to 29: The authors report a lot of flight details in the text. However, for better clarity, these details should be transferred either in Table 1 or in an additional table.

Page 16156, lines 17 to 20: The authors mention that the striking O₃ maximum near 19 km will be discussed in a future paper. Anyhow, since it is a dominant feature located at the upper edge of the TTL, a few sentences for a possible explanation of this feature are appropriate here.

Page 16163, lines 14 to 19: The definition of the “critical level” is not clear to me. Why is this connected with an easterly wind? Why is this important for the discussion of the SPIRALE results? The corresponding sentences should be rewritten for better clarity.

Technical corrections:

Page 16149, line 5, and page 16151, line 25: The letter “r” in the word “Infra” is missing.

Page 16151, line 22, page 16154, line 22, and page 16158, line 13: As far as I know Northeast Brazil is the name for a geographic region. Hence you should write “North-east” in one word.

Page 16154, line 7: Please insert a comma after “2005”.

Page 16157, line 3: Please insert also a comma after “above”.

Page 16158, line 28: The word “correlation” should be plural.

Page 16158, line 29: “If there were . . .”. Please exchange “were” by “was”.

Page 16159, line 13: Please write “deviation” instead of “departing”.

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Page 16161, line 15: Please write "... they show ..." instead of "... it shows ...".

Page 16161, line 24: You should either omit the adverb "respectively" here or move the adverb to the end of the sentence.

Page 16162, line 10: Please write "efficiently transports" instead of "transports efficiently".

Page 16162, line 11. Again, please write: "also shows" instead of "shows also".

Page 16162, line 12: Please correct the unit to "ppbv".

Page 16164, line 12: Please write "north-west" with small letters and insert the article "the" before "SPIRALE".

Page 16167, line 18: The accents are missing in the name "Dévényi".

Page 16167, line 25: Please insert a blank after "400".

Page 16168, line 3: Please write "constrain" instead of "constraint".

Page 16171, line 9: A full stop is missing at the end of this reference.

Page 16172, line 14: Pickering et al. is not cited in the text.

Page 16172, line 23: Randel et al. is also not cited in the text.

Page 16175, Fig. 1: The black cross which denotes the location of Teresina is not visible in the figure.

Page 16177, Fig. caption 3, last line: "... over the each ..."; please delete the article "the".

Page 16178, Fig. caption 4, last line: Please move the adverb "respectively" to the end of the sentence.

Page 16179, Fig. caption 5, line 2: "CO and O3 are is in ppbv". Please write, e.g. "CO and O3 are given in ppbv".

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Page 16182, Fig. caption 8: Please delete the adverb "respectively" in the last two sentences.

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