

***Interactive comment on* “Injection in the lower stratosphere of biomass fire emissions followed by long-range transport: a MOZAIC case study” by J.-P. Cammas et al.**

Anonymous Referee #2

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Comments on Cammas et al. "Injection in the lower stratosphere of biomass fire emissions followed by long-range transport: a MOZAIC case study"

General comments

This is a nice paper describing the injection of forest fire pollution into the lower stratosphere by convection, as observed by the MOZAIC aircraft and groundbased lidar. Two very different models are applied to the study of this event, bringing complementary insights to the study, and both well suited to the task. The paper is well written, and I have only minor comments. Some of the figures need to be clearer (better/larger labels mainly).

Specific comments:

———— Page 20926

Line 5: 'is done using' -> 'uses'

Lines 15-20: At first glance these two sentences seem somewhat contradictory - if the model showed pure boundary layer air then shouldn't the deposition be 100% of the boundary layer tracer, not 15-20%. I think there is not really an inconsistency here, but a bit more clarity might help.

———— Page 20927

Line 1: I'd delete 'too' (penultimate word), it doesn't feel right for a paper (more like something one would write in a proposal).

———— Page 20928

Line 1: '... is challenging. Additional studies of other events are required to better ...'

———— Page 20929

Line 17: I didn't really understand the discussion of 'conversion of HNO₃'. Is this the conversion of HNO₃ to something directly detected by the sensor? Why is this relevant for calibration?

———— Page 20930

Line 20: 0.2 degrees - is this latitude, longitude, great circle? Might it be better to quote this in km?

Line 21-23: Are the details on height change -> trajectory launch criteria really needed here, given the UT/LS focus. How about simply saying: 'Also, whenever it changes by more than 400m above 3km (with finer criteria at lower altitudes)'

———— Page 20931

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Line 1: delete comma add 'are' after 'calculations'

———— Page 20932

Line 3: Add '2004' after '30 June'

Line 23: 'strong values' -> 'large abundances'

———— Page 20934

Line 4: 'terms' -> 'the', 'prevents from using' -> 'precludes the use of'

———— Page 20938

Line 17: 'center of interest' -> 'focus'

———— Page 20939

Line 6: delete 'a' before 'slightly'

———— Page 20940

Line 8: 'cube' -> 'box' (the sides are different length)

———— Page 20943

Line 17: 'of' after 'impression'

Line 18: 'did come' -> 'came'

Line 26: '...indication OF where emissions...'

———— Figure 1

All the labels (contour labels and axis labels) are way too small in this figure. The contours are very hard to see against the colors. I'd have fewer, bolder contours, 2-3 for each field only.

———— Figure 2

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This figure sorely needs a legend, or labels on the lines. The reader should not have to wade through a wordy caption to identify the lines. Again the text is far too small.

————— Figure 3

The labels are too small for the top plot. There are too many vertical dotted lines in the bottom right figure, also the x-axis labels are colliding.

————— Figures 4 and 5.

Again, the labels are too small. The caption needs to give more details about how to interpret the colored contours. I think I got it but some readers may be at a loss. Why bother to show (c) and (d) in the bottom half, given that they're so close to (b)? For that matter there is little difference between (a), (b) and (c) in the top half.

————— Figures 6

The small numbers are simply impossible to see, make them bigger/bolder. Part of the problem is your choice of dense grid, I'd leave it off or at least make it coarser.

————— Figure 7

I don't really see what the colored aircraft track adds here, and using the same color scale for both this and the contour fields leads to very unhelpful units. I'd put the contour field in hours not percent, and show the CO aircraft track with a different color scale, or perhaps just show the high CO points in black and low CO in grey or something. In the caption express the $7.2e4$ s as 20 hours.

————— Figures 8-12

Text too small, particularly for figure 11.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 20925, 2008.

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