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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Evidence of the impact of deep convection on reactive volatile organic compounds in the upper tropical troposphere during the AMMA experiment in West Africa" *by* J. Bechara et al.

J. Bechara et al.

agnes.borbon@lisa.univ-paris12.fr

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We would like to thank the referee for its comments and suggestions. We have the following responses to the referee's comments.

Referee comment: Section 6.2 I suggest that the authors could clarify the "useful information" contained in Figure 8. The authors state that "Clearly, two sets of points are distinguished depending on non-convective situations (black) and convective situations (red)" and again later in the paragraph "UT NMHC concentrations are thus governed by

two distinct regimes", however, I would be surprised if the two slopes are statistically distinct? As noted in the text, the convective case data are so much "more diffuse" (I would prefer to use the term less well correlated - or more scattered), that the two populations seem to overlap.

Response: This approach is based on photochemical clock approach in order to have a qualitative evaluation of the chemical processing in the air masses. Since trans-2-pentene has a lifetime of few hours, the variability along trans-2-pentene/benzene axis denotes chemical processing in fresh air masses, while the variability along Toluene/benzene axis denotes chemical processing on several days (toluene has a lifetime of about 2 days). So, only fresh air masses will show variability along trans-2-pentene/benzene axis: this is the only case for convective influenced air masses showing that significant mixing ratios of trans-2-pentene are transported into the UT. Another issue is to compare the slopes knowing that the theoretical slope is expected to have a value of 13 when all assumptions are respected (no dilution or mixing, ratios are only governed by chemistry regarding OH). Since slope values are far from theoretical value, we deduce that we cannot get rid of dilution and mixing. Moreover, the lower the slope is more processed air mass is, diluted and mixed with other air masses of different photochemical ages.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 20309, 2009.