Atmospheric Chemistry and Physics Discussions

Interactive
Comment

Interactive comment on "First space-borne measurements of methanol inside aged tropical biomass burning plumes using the ACE-FTS instrument" *by* G. Dufour et al.

G. Dufour et al.

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The authors thank the referee for his interest in the article and his suggestions for improvements. The comments made are addressed below.

Comment 1: we agree that the term "tropical" is not completely well chosen as southern mid-latitude occultations are used for the analysis. This will be added in the title.

Comment 2: the vertical resolution is mainly limited by the field-of-view of the instrument. The tangent altitude spacing is variable and depends on the beta angle (the angle between center of Earth-Sun line and the orbit plane). When the beta angle increases, the tangent altitude spacing decreases and it can be lower than 1 km. As explained in Boone et al., 2005, the retrieval is performed on the tangent altitude grid

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and then interpolated to a 1-km grid.

Comment 3: Yes, this is the fractionation of isotopologues 4 and 5 of ozone that is fixed with respect to the normal isotopic abundances between the main isotope and these two.

Comment 4: Rinsland et al., 2005a showed that the air masses sampled by ACE-FTS and analysed here were aged about 1 week. Only species with a larger lifetime are then detectable. We agree that this need to be precise.

Comment 5: the term "parameters" will be replaced by "variables"

Comment 6-7: the retrieval is well a global fit retrieval. This has been stated in paragraph 2.1 (page 4, line 12) but this is effectively useful to say this again at the beginning of paragraph 2.2 and to add that all tangent heights are included in the vector of measurements.

Comment 8: the term "systematic errors" was used in opposition to "statistical errors" but this is effectively ambiguous. This will be replaced by "errors induced by uncertain parameters".

Comment 9: we are perfectly aware that the correct way to evaluate error due to uncertain parameters that are described by a profile is to consider the covariance matrix of vector b. However, this matrix is generally unknown and difficult to evaluate. That's why we chose to apply a scalar perturbation of the entire profile. This approach should maximize the errors and then give a realistic estimation of them. Another way to evaluate the impact of uncertain parameters (b) would have been to apply random noise to each parameter a large number of times and to do the statistic but due to the time consumption of methanol retrieval (line-by-line forward model + large window), this approach was difficult to realize.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 3945, 2006.

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