RIGC, Yokohama, Japan

November 18, 2009

Dear Anonymous Referee 2,

Thank you for your comments on the paper "Sensitivity of ensemble Lagrangian reconstructions to assimilated wind time step resolution".

(i) We have added more ozonesondes from the SHADOZ database for the period in which the special 1 hourly windfields are available (January and February 2004). They provide a different kind of information, of statistical nature, and we think they support better the conclusions and are complementary to the detailed analysis of the HIBISCUS ozone profile. Although in some cases a vertical resolution of 1 Hz may not add a large amount of information, in the case used to motivate this geometrical study, the relatively small scale of the intrusion analysed ( 500 m in the vertical) calls for high resolution measurements to define its shape and amplitude with a better accuracy than what could be obtained with standard ozone sondes.

Also this additional dataset was studied with ERA Interim reanalysis in order to compare the operational fields with improved assimilated winds.

(ii) We have added information about the fact that we do not take into account ozone production/loss at the end of paragraph 2.2. The HIBISCUS case, including the characteristics of the initial 3D ozone fields from REPROBUS, is also thoroughly discussed in Pisso and Legras (2008). The use of REPROBUS fields in connection with TRACZILLA is also discussed in Legras et al (2003) and Legras et al. (2005).

(iii) We do not feel this is meaningful to give some statistical measure for the HIBISCUS case since we only consider one profile and a main structure on this profile. We have, however, added a statistical measure of agreement in order to analyze the large number of SHADOZ profiles. It is based of the integrated O3 along the profile as in Pisso et al. (2009) [1].

Yours sincerely,

The authors

[1] Pisso, I., E. Real, K. S. Law, B. Legras, N. Bousserez, J. L. Attié, and H. Schlager (2009), Estimation of mixing in the troposphere from Lagrangian trace gas reconstructions during long-range pollution plume transport, J. Geophys. Res., 114, D19301, doi:10.1029/2008JD011289.