

***Interactive comment on* “Technical Note: In-situ quantification of aerosol sources and sinks over regional geographical scales” by G. Buzorius**

Anonymous Referee #3

Received and published: 20 February 2009

The manuscript presents interesting study on airborne eddy covariance flux measurements over the ocean and land. The measured particle concentrations vary greatly occasionally due to single (ship plumes) or more extended (highway or cities) sources. This is the challenge for the technique which assumes stationarity in time or homogeneity in space. Filtering could reduce to some extent the problem but on the other hand this would result in underestimation of fluxes since transport by large eddies would be excluded in calculated co-variance. The author recognizes sufficiently the uncertainty arising from non-stationarity in interpretation of results. After improving spatial resolution the author verifies that the calculated fluxes are in good agreement with larger scale averages.

The results are interesting qualitatively as well as the technique could be very useful for

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



exchange studies of atmospheric aerosols. The manuscript is suitable for publication in ACP after addressing the comments below.

Page 1304 lines 7-9 would be useful to indicate directly that the study aims to present fluxes with 3 km resolution compared to 10 km resolution in previous study.

Page 1306 line 8, it is stated that over bar means an average over the 200 or 60 s time period. Indicate also that these two time periods correspond to 10 km and 3 km resolution with the average airplane speed.

Page 1306 lines 11-18 about errors. Two first errors are described as random. Mention also that the third error is systematic in nature and give typical value with reference.

The same page lines 21. Explanation of footprint should be better formulated although exact definition is not necessary. 'The sea surface fetch' is not definitely the footprint.

Page 1308 lines 4-6. Is the Webb correction due to temperature fluctuations applicable here since 1 m long conductive tubing was used? 1 m long metal tube could rather well damp temperature fluctuations and in that case the respective corrections should no be done. This seems not to be of big practical importance since the corrections are relatively small as reported in results section (page 1309 lines 24-27).

Page 1313 lines 5-6 the downward fluxes inside the bay, western side of the pollution plume. What would be the deposition velocities of aerosols to sea surface and could the observed downward fluxes be rather the result of downward mixing of plume in strong vertical concentration gradient conditions?

Line 1314 line 9 'measured fluxes' in parenthesis is confusing.

Page 1315 line 16, what does it mean decoupling of virtual potential temperature? Was it strong gradient as an indicator of inversion layer, i.e. a layer between two decoupled layers?

Page 1316 line 16-17, an uptake of particles is a confusing expression because uptake

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



did not occur but the upward transport.

Page 1318 lines 3-6 the sentence is not clear. Figures 3, 5 and 6, was there any interpolation technique used in figure construction in addition to averaging of fluxes to 0.035x0.035 degrees cells? If yes, then mention.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 1301, 2009.

ACPD

9, S322–S324, 2009

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

