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## ***Interactive comment on “Quality control of CarboEurope flux data – Part I: Footprint analyses to evaluate sites in forest ecosystems” by M. Göckede et al.***

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Received and published: 5 February 2008

### General Assessment

Overall, this paper is well laid-out and the presentation is clear and concentrates on relevant results. The graphical representation and use of scientific literature is adequate. The abstract covers the findings of the paper, the sections however are sometimes a bit lengthy. Yet, my main concern of the analysis is that it might include a bias with respect to the differences in eddy covariance data quality reported for CO<sub>2</sub> versus latent heat fluxes. According to the study, eddy covariance method seems to perform worse for latent heat than for CO<sub>2</sub> or momentum. Is it possible that the use of the same low

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release height of particles ( $0.01 \cdot$  canopy height) for  $\text{CO}_2$  and  $\text{H}_2\text{O}$  causes some of the differences in eddy covariance method performance reported for latent heat,  $\text{CO}_2$  or momentum fluxes?

- Page 6, 3.1 Source area analysis: How sensitive are the results to the assumptions on the release height of particles?  $0.01 \cdot$  canopy height is a) not the main source height in the vertical for either  $\text{CO}_2$  or  $\text{H}_2\text{O}$  molecules, b) the daytime source height might differ from nighttime periods, and c) the main source height might be different for  $\text{CO}_2$  and  $\text{H}_2\text{O}$  molecules.  $0.01 \cdot$  canopy height might be the best choice for  $\text{CO}_2$  molecules at night only, potentially resulting in a bias towards stable conditions for  $\text{CO}_2$  fluxes.

- Page 17, bottom (statement on "conservative estimates" due to low release height): Is it possible that the estimates are much more conservative for latent heat than for  $\text{CO}_2$ ? Would latent heat assessments change when for water fluxes a more realistic release height (of  $0.6$  or  $0.8 \cdot$  canopy height) would be employed?

I think this manuscript demonstrates how important quality assessments of eddy covariance data are for optimal use of large data bases in the scientific community. However, it suffers from the above mentioned weakness, and a sensitivity analysis for the particle release height should be added to a revised version, e.g. for 2-3 selected sites.

#### Minor Comments

Page Introduction: Add paragraph on other landscape heterogeneity assessments?

Page 4 top: Are there other methods for data quality analyses?

Page 6: Move discussion on differences in map resolution from "Data" introduction to discussion section

Page 9, bottom, Page 15 top: For (Soroe-) LE problems and tubing see Ibrom et al. AFM 2007 (147) p. 140ff

Page 18, middle: Give references for  $u^*$  filtering methods (e.g. Gu et al.)

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Fig. 8: Why does the figure not show the site names? Sites where planar fit coordinate rotation still leaves a major non-zero mean vertical wind velocity are given in the text only.

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Interactive comment on Biogeosciences Discuss., 4, 4025, 2007.

**BGD**

4, S2579–S2581, 2008

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