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Comment

Interactive comment on “The imprint of surface fluxes and transport on variations in total column carbon dioxide” by G. Keppel-Aleks et al.

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We congratulate the authors of the Keppel-Aleks et al., 2011, manuscript on having obtained important results related to the Northern Hemisphere carbon cycle.

The results presented confirm and appear to be in agreement with the analysis and conclusions presented in Schneising et al., 2011, based on SCIAMACHY/ENVISAT satellite data. In Schneising et al., 2011, it is written that: "In contrast to the growth rates, the seasonal cycle amplitude differences between SCIAMACHY and Carbon-



Tracker are significant. The less pronounced seasonal cycle of CarbonTracker compared to the satellite data might be explainable to some extent by a too low net ecosystem exchange (NEE) between the atmosphere and the terrestrial biosphere; for example Yang et al., 2007 estimate that NEE in the Northern Hemisphere is about 25% larger than predicted by the CASA (Carnegie- Ames Stanford Approach) biogeochemical model which is also used in CarbonTracker. This underestimation is of the same order of magnitude as the scaling needed to fit the amplitude of the northern hemispheric seasonal cycle of CarbonTracker to SCIAMACHY (38%, see Fig. 4)."

Unfortunately, the Schneising et al., 2011, publication has not been cited in Keppel-Aleks et al., 2011, although the results are highly relevant. This is true for the general conclusion but also with respect to the magnitude of the underestimation of the seasonal cycle amplitude, which is quantified to be 38% in Schneising et al., 2011, and 40% in Keppel-Aleks et al., 2011, i.e., both estimates are in good agreement.

We recommend to cite the Schneising et al., 2011, publication in the revised manuscript of Keppel-Aleks et al., 2011.

Reference:

/Schneising et al., 2011/ Schneising, O., Buchwitz, M., Reuter, M., Heymann, J., Bovensmann, H., Burrows, J. P., Long-term analysis of carbon dioxide and methane column-averaged mole fractions retrieved from SCIAMACHY, *Atmos. Chem. Phys.*, 11, 2881-2892, 2011. Link: <http://www.atmos-chem-phys.org/11/2863/2011/acp-11-2863-2011.pdf>

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