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Atmospheric Measurement Techniques Discussions

Interactive comment on "In-situ measurements of oxygen, carbon monoxide and greenhouse gases from Ochsenkopf tall tower in Germany" *by* R. L. Thompson et al.

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P1249L1: there are various complimentary methods for monitoring changes in fluxes from natural sources/sinks. Here are just two: i) eddy-covariance measurements (e.g. the programme Fluxnet, which makes long-term measurements of fluxes also in natural/unmanaged ecosystems, ii) carbon storage measurements (i.e. directly measuring the C stored in soils and vegetation and was implemented in the CarboEurope project)

P1249L11: 'small spatial variability' refers to differences between marine stations. The gradient between two marine stations at similar latitude is generally much smaller than that between two continental stations at similar latitude, because the largest fluxes

(and largest variability in fluxes is over land) and this signal is therefore more diffuse at marine stations.

P1267L24: For there to be a negative vertical gradient (decreasing concentration with altitude), there needs to be a positive surface flux (that is in the absence of chemical losses in the atmosphere). (The amplitude of the gradient will of course depend on the vertical mixing and on the magnitude of the surface flux.) Most often no vertical gradient was detected in the trace gases CH4, N2O, CO and SF6, even under stable conditions. This is due to the fact that the fluxes of these gases in the vicinity of the tower are very small or even absent. In regions where there are significant fluxes of these gases, one would of course expect there to be an accumulation at the surface under stable conditions but when this signal is transported (by advection) the signal will become more diffuse.

P1270L13: We have generalized the statement about the area of influence to include Hessen and NordRhein-Westfalen in western and north-western Germany: 'The peak (19 September 00:00) coincides with a stagnation event, with the area of strongest influence coinciding with the densely populated and industrialised regions of Hessen and NordRhein-Westfalen, in western and north-western Germany (Fig. 9b).'

P1271L16: We have made an amendment to this text here and replaced the statement: 'The largest source of N2O is a natural one, that is, from soils under natural vegetation, whereas the anthropogenic sources are relatively small and quite localised. Therefore, the contribution from anthropogenic fluxes did not increase much at this time.' with 'For N2O, fluxes from soils under natural vegetation and from agricultural soils are both attributed to 'natural fluxes' (that is represented by the green curve). This forms the largest N2O source, and it can be seen that even while the area of strongest influence was a densely populated and industrial one, this flux still dominates the signal. (The anthropogenic flux, the blue curve, is that from industry, fossil fuel combustion and waste).'

Fig. 3. The authors are unsure about which comment (from reviewer 1) the reviewer is referring to here.

The authors have noted the remaining comments from reviewer 2 but will not address each one individually here as they refer mostly to wording.

P1250L23-25: the 4 citations were referring to the same special edition of AMT. When this manuscript was submitted, it was thought that these papers would be submitted at the same time (the exact references were unknown). These citations have now been updated to their current status.

Interactive comment on Atmos. Meas. Tech. Discuss., 2, 1247, 2009.