

## ***Interactive comment on “A Relaxed Eddy Accumulation (REA)-GC/MS system for the determination of halocarbon fluxes” by K. E. Hornsby et al.***

**K. Hornsby**

keh114@york.ac.uk

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Discussion of the effect of the non-uniform, non-horizontal surface on the flux measurement

It is assumed that the mean value of  $\bar{w}=0$  over the sampling period (mass balance), and that the trace gas of interest only moves horizontally until transported away from the surface by turbulence. For a uniform and horizontal surface,  $\bar{w}=0$ , resulting in negligible vertical transport. However, the terrain at Mace Head slopes down towards the sea and comprises of a mixture of boulders and grass. This creates a bias in the mean vertical wind speed. Bowling et al. (1998) found that correcting for bias in  $\sigma w$  by applying

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digital filters to the sonic data before sampling had very little effect on the measured flux although they did conclude that further investigation was required. Consequently, no adjustment was made to account for potential bias at the point of sampling in this investigation.

Additional discussion regarding the non-uniform distribution of macroalgae

Mace Head was selected for the initial trial of the new flux measuring technique because high fluxes were expected given the well documented halocarbon concentrations at this site (Carpenter et al., 1999). Detailed consideration of the spatial location of sources was considered beyond the scope of this trial deployment, but would be important in future work using the REA system to assess the impact of different macroalgae to halocarbon fluxes

Discussion of why macroalgae, rather than sea water, was considered the main source and how its irregular distribution may have affected flux measurements

It has been previously found that macroalgae are the major source of halocarbons at Mace Head (Carpenter et al., 2000 and 2001), as stated in section 3.3 (page 962). The irregular distribution may be the reason for the occasional deposition of bromocarbons, as discussed on page 962 and could also mean that different fluxes are measured in different wind sectors, introducing more “noise” into the measurements.

Bowling, D., Turnipseed, A., Baldocchi, D., D.D. (1998) The use of relaxed eddy accumulation to measure biosphere-atmosphere exchange of isoprene and other biological trace gases. *Oecologia*, pp. 306-315.

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trihalomethanes and other short-lived halocarbons in the coastal East Atlantic, *Global Biogeochem. Cycles*, 14, 2000, 1191-1204.

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