Geophysical Research Abstracts,
Vol. 10, EGU2008-A-07563, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-07563
EGU General Assembly 2008

A Relaxed Eddy Accumulation (REA) system for the measurement of halocarbon fluxes in the field

K. Hornsby (1), C. Jones (1), R. Chance (1), M. Flynn (2), J. Dorsey (2), M. Gallagher (2) and L. Carpenter (1)

(1) Department of Chemistry, University of York, Heslington, York, YO10 5DD, UK.

(2) Centre for Atmospheric Chemistry, School of Earth, Atmospheric and Environmental Sciences, The University of Manchester , Simon Building, Oxford Rd., Manchester, M13 9PL, UK.

Very short lived halocarbon species (VSLH) are thought to play an important role in the chemistry of the marine boundary layer, providing iodine radicals which go on to produce secondary organic aerosol and cloud condensation nuclei and may affect the atmospheric oxidising capacity. Our data from a cruise in the tropical north Atlantic indicates that here, the very short-lived dihalomethanes (CH_2I_2, CH_2ICl and CH_2IBr) may be the primary carrier of iodine to the marine boundary layer. However, calculation of sea-air fluxes of dihalomethanes using the standard two-layer flux approximation, in conjunction with air and sub-surface seawater measurements, is subject to large uncertainty because these compounds photodissociate rapidly in the upper water column and will therefore likely exhibit a pronounced near-surface vertical gradient. Here we report direct flux measurements of VSLH using REA, a third generation micrometeorological technique based on the Eddy Covariance method which samples the air column based on the sign of the vertical wind speed. An automated REA system has been developed and was deployed for field trials during the Bioflux II campaign, which took place at the Mace Head research station on the west cost of Ireland in September 2007. The air is captured in carbon-based adsorbent reservoirs for offline GC-MS analysis. Measurements of 10 halocarbons were made including CH_2I_2 and $CHBr_3$. The results show fluxes in line with those deduced from other techniques and enhanced emissions at low tide for some VSLH.