Eddy covariance measurements of the sea spray aerosol flux over the open ocean

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Most estimates of sea spray aerosol source functions have used indirect means to infer the rate of production as a function of wind speed. In more recent years the technology has become available to make high rate measurements of aerosol concentration suitable for direct eddy correlation (EC) determination of the particle flux.

During the Sea Spray Gas Flux and Whitecap (SEASAW) study cruises a compact aerosol spectrometer (CLASP), which produces a 16-channel aerosol size spectrum ($0.12 < r < 9.25$ micrometres) at a rate of 10 Hz, was collocated with a sonic anemometer on the foremast of the RRS Discovery. Two research cruises were undertaken in the NE Atlantic on board the RRS Discovery [2]. This allowed the calculation of size segregated aerosol fluxes via EC in the open ocean at mean 10 m wind speeds of up to 18 m s-1 alongside estimates of the whitecap fraction, measurements of the ship motion, background meteorology and aerosol concentrations.

We present aerosol flux results from the field campaigns using the EC flux method and compare these with flux estimates from the equilibrium method using the same data set. Source functions calculated by the EC method are compared to sea spray source functions from the literature. An estimate of the aerosol particle dry deposition flux over the open ocean is also calculated by using the eddy covariance flux measurements and compared to literature.

[1] Brooks, I. M., and co-authors. (2009): Physical Echanges at the Air-Sea Interface UK-SOLAS Field Measurements. *Bulletin of the American Meteorology Soceity.* (in press).

Low-cost adsorption media for removal of toxic metals from contaminated water

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Many of the treatment processes currently used in metal-removal from contaminated water bear a significant cost. Thus the search for low-cost materials with metal-binding capacities has intensified and local natural material may be of great interest for treatment applications especially for developing countries. In this study, adsorption capacity of Brown seaweed and shrimp shells were compared with a strong acid cation exchange resin (CER) in batch and column experiments. A case study site was used as a reference point and column experiments were designed in a similar manner although at different scale**.** Each media reduced concentrations of the target metals to levels below defined reference values. If the alternative adsorption media perform as well in the field as the laboratory, the results suggest that the media tested would completely remove the toxic metals in the water. Seaweed and shrimp shells had stronger affinities for Pb and Cu than CER. However, CER was superior in affinity for Zn, the most weekly bound metal. Moreover, the results showed that Ca in the solution reduced the adsorption capacity of the other metals. This illustrates the limitations of applying the behaviour of the batch studies with single metal solutions to a multi-component system with competitive adsorption