

AIR-SEA CH₄ FLUXES FROM EDDY COVARIANCE MEASUREMENTS IN THE BALTIC SEA

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The potential of micrometeorological methods has been poorly exploited for the estimation of CH₄ fluxes (FCH₄) in marine environments. The use of these techniques (e.g. eddy covariance (EC)) can be useful for constraining the regional and global estimates of oceanic CH₄ contributions to the atmosphere, as well as, to improve our understanding about air-sea exchange processes.

We investigate the viability and quality of EC measurements to estimate FCH₄ from a land-based tower in the Östergarnsholm station in the central Baltic Sea. We present one year of continuous measurements of direct air-sea methane fluxes. We observe positive FCH₄ throughout the year, however, different physical and biogeochemical processes are considered to be the main drivers of the flux. Both the air-water concentration gradient and the physical conditions (i.e. wind speed) are crucial parameters controlling the flux. The results are in well agreement with other CH₄ measurements in the Baltic Sea (MEMENTO database) suggesting that the EC technique is a useful tool for improving the understanding of air-sea FCH₄. EC measurements open the possibility for continuous and direct estimations of FCH₄ in marine environments, furthermore, they are necessary to capture the variability of FCH₄ and the controlling mechanisms.

