



# 1 In situ measurement of oxygen dynamic in an intertidal sandflat

M. Rauch , L. Denis and F. Schmitt

Laboratory of Oceanology and Geosciences, Universite des Sciences et Technologies de Lille , France

Mathieu.Rauch@ed-univ-lille1.fr / Fax: +33-321992901 / Phone: +33-321992906

Waves and currents influence near-sediment flow dynamics, turbulent transport of oxygen and thereby the diagenetic processes in the top few millimeters of the sediments. These hydrodynamic forcings are almost never represented in conventional approach of oxygen dynamic at sediment water-interface (like benthic chambers or vertical oxygen microprofiling). Moreover, complete enclosing of benthic systems may enhance artifacts for permeable sediment due to the suppression of horizontal pressure gradient.

Here, we present a newly developed *in situ* device for measurement of fluctuations in oxygen concentrations over an exposed intertidal sandflat. This device, based on the use of vertically positioned Clark-type oxygen microelectrodes, allows the acquisition of high frequency measurements without creating artifacts or alterations of sediment-water interface.

Spectral analysis method are applied to characterise the raw time series of oxygen concentration and to reveal scaling ranges in association to wave induced hydrodynamic forcing. We also describe the importance of wind-induced waves as a driving force of oxygen transport and flux between permeable sandy sediments and shallow waters.