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Scaling comparison of high frequency simultaneous oceanic and atmospheric temperature time series

F.G. Schmitt

CNRS, Lab. Oceanology and Geosciences, Laboratory of Oceanology and Geosciences, Wimereux, France
(francois.schmitt@univ-lille1.fr, +33 321 99 20 01)

We consider a database of 7 years of high frequency (1 hour resolution) simultaneous temperature measurements in the atmosphere and coastal waters of Boulogne-sur-Mer (France). The oceanic data come from the MAREL Carnot system and the atmospheric data from Meteo France.

We consider first the mean annual cycle and compare both curves, and then consider the scaling properties of the fluctuations and of their cross correlation. We perform the analyses using Fourier approach, structure functions and Empirical Mode Decomposition. With these approaches we can characterize the coupling between both series, and also propose a stochastic modelling describing the multiscale coupling between both fields.