



Oceanic mixed layer heat budget in the Eastern Equatorial Atlantic using ARGO floats and PIRATA buoys

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During the observational phase of the AMMA/EGEE program (2005-2007) dedicated to the West African Monsoon, lots of new data were collected in the eastern equatorial Atlantic to document the interaction between the oceanic mixed layer and the marine atmospheric boundary layer. How sea surface temperatures are influenced by the oceanic and atmospheric dynamics and/or thermodynamics and how the Atlantic cold tongue affects the West African Monsoon remain open questions.

During the period of AMMA/EGEE, the number of observations has considerably increased throughout the eastern equatorial Atlantic. In this study, we propose an original oceanic mixed layer budget combining both oceanic in-situ observations from operational platforms (ARGO floats and PIRATA moorings), atmospheric operational NWP models (for surface heat fluxes) as well as remotely sensed retrievals (TMI AMSR-E SSTs and upper current analyses). The objectives are to assess the contribution of the main processes (i.e. air-sea exchanges, advection, entrainment) at play in the upper ocean.

A method has been developed to reconstruct the seasonal cycle and the interannual variability of the oceanic mixed layer heat content. The basin of interest (15°W, 15°E-10°S, 6°N) has been divided into nine boxes, selected to reflect the regional features in the dynamics and thermodynamics. Our results indicate the existence of a marked seasonal cycle despite a very contrasted thermal balance from box to box. In some boxes, the budget is closed (in the southernmost boxes), while not in others. For instance, in the cold tongue box, we suspect that the vertical heat diffusion, which cannot be estimated directly from observations, has a leading contribution in boreal summer.