

OCEANIC CAMPAIGNS AND MEASUREMENTS FROM OPEN OCEAN (AMMA TASK TEAM N°6)

Bernard BOURLES (1), Robert L.MOLINARI (2) and Peter BRANDT (3)

(1) IRD/LEGOS, Plouzané, France (2) NOAA/AOML, Miami, FL, USA
(3) IFM-GEOMAR, Kiel, Germany

Abstract

This poster presents a summary of the international field operations at sea planned in the framework of AMMA. All these actions are presented in more detail in the TT6 document (AMMA Task Team n°6, concerning the Oceanic campaigns and measurements from open ocean (EOP and SOP), that can be found on the AMMA web site:

http://www.lthe.hmg.inpg.fr/AMMA_International/organisation/2_1Level_Role_TTs.php.

Résumé

Ce poster présente un résumé des actions océanographiques de terrain programmées dans le cadre d'AMMA. Toutes ces actions sont détaillées dans le document TT6 (AMMA Task Team n°6, concernant les campagnes océaniques et les mesures en mer (EOP et SOP), qui peut être consulté sur la page web AMMA :

http://www.lthe.hmg.inpg.fr/AMMA_International/organisation/2_1Level_Role_TTs.php.

Scientific justification and objectives

The oceanographic observations of AMMA will support the land and atmospheric measurements during the three observing periods; Long term Observing Period (LOP), Enhanced Observing Period (EOP), and Special Observing Period (SOP). Detailed scientific rationale for these data is given in both international and national AMMA documents (e.g., French API, EU, US). Specifically, the TT6 aims to provide needed measurements for:

- 1) the study of processes that determine seasonal to interannual variability of observed sea surface temperature (SST), sea surface salinity (SSS), mixed layer depth and heat content, in the Tropical Atlantic and in the Gulf of Guinea, and their linkage with West African land surface conditions;
- 2) the study of processes that determine the seasonal evolution of the cold tongue - Inter Tropical Convergence Zone (ITCZ) - West African Monsoon (WAM) system.
- 3) the study of both ocean and atmosphere boundary layers and air-sea exchanges;
- 4) the validation of models satellite data and products

Overall strategy

The overall strategy is mainly based on (1) the acquisition of in situ measurements in the eastern Tropical Atlantic and the Gulf of Guinea (GG) and (2) the integration of these data to characterize the air-land-sea monsoon system during the three observing periods of AMMA (and thereby resolving different timescales ranging from annual to interannual).

- For the LOP and EOP observations, the measurements will be principally collected through existing sustained observing networks and acquisition programs (e.g., PIRATA ATLAS buoy network, the Voluntary Observatory Ship (VOS) expendable bathythermograph (XBT) networks, surface drifters of the Global Drifter Program, and the ARGO and CORIOLIS operational programs). LOP/EOP measurements will also be acquired through oceanographic research vessels, coastal stations, tide gauges and the meteorological station at São Tome Island (Eq-6°E). These measurements will be enhanced by additional observations directed at specific monsoon questions.

- For the SOP WAM process studies, a large number of additional oceanic and meteorological measurements will be collected. The different types of measurements (lagrangian, eulerian, synoptic, surface and subsurface, high frequency acquisition etc...) and the different measured parameters (currents, hydrology and even tracers) should allow obtaining the most complete necessary data sets for the process studies.

EOP dedicated cruises

In order to assess interannual and seasonal variability, six EGEE cruises in the Gulf of Guinea are planned in the framework of AMMA-France, with two cruises per year scheduled during the three EOP AMMA years (2005-2007). See poster 0.02. The two first EGEE cruises have already been achieved in 2005 (refer to poster 0.02). The EGEE 3 cruise, during the first phase of the SOP, will be carried out in spring-summer 2006 (see poster 0.01). Maintenance (or replacement) of the PIRATA ATLAS moorings located in the Gulf of Guinea will also be conducted during these cruises. In addition to classical current (SADCP and LADCP) and hydrological (T,S,O₂) measurements, surface drifters (coll. NOAA/AOML) and ARGO/CORIOLIS profilers are deployed during each cruise.

SOP dedicated cruises

- **SOP I U.S. Cruise** : This cruise is scheduled for May-June 2006. During this cruise, in addition to classical current and hydrological measurements in the upper ocean layers, 2 ATLAS buoys will be deployed at positions along 23°W. In addition, surface drifters and ARGO profilers will be deployed in the green shaded area to the right. Support will also be requested for two other ATLAS moorings to be deployed in 2007. These buoys along with the ones located along 10°E will collect data in both the ocean and atmosphere boundary layers and the variability on both sides of the ITCZ during all the phases of the WAM.

- **SOP-I German Cruise**: A German cruise by IFM-GEOMAR with R/V METEOR is funded and scheduled from June 6 – July 9 2006, in the framework of a German CLIVAR-TACE contribution. Main part of this cruise will be the deployment of a current meter mooring array consisting of 5 moorings near 23°W at the equator as well as intensive microstructure measurements in the equatorial region. During the cruise twice-daily radio-soundings will be performed. The cruise will also be used to deploy ARGO profilers.

- **SOP-I French Cruise:** During EGEE 3 (EOP & SOP 1 campaign), the Benin section will be occupied in coordination (and simultaneously) with measurements from aircrafts. This cruise will document the pre-onset and onset of the monsoon offshore, with particular attention directed at surface fluxes, oceanic turbulence and advection of humidity. Atmospheric turbulence measurements will be collected using a turbulent flux measurements system. This system will provide oceanic flux measurements for comparison with observations obtained from different methods. Radio-soundings will also be launched from the vessel.

- **SOP Senegalese Cruises:** Several 5-day cruises are proposed in the framework of the oceanographic component of the AMMA-Senegal project. These cruises could be conducted using the R/V ITAF-DEME of CRODT/ISRA, in collaboration with the French AMMA/EGEE program. The French program would partly fund the vessel chartering. Three cruises are planned at about one month interval from Dakar to Cap-Vert to survey the ocean boundary layer with CTD and XBT profiles, and could be also opportunities for surface drifter and profiler deployments. These cruises are not neither funded nor scheduled yet.

EOP /LOP observations

Many other kinds of measurements will be, or are already, acquired from : PIRATA ATLAS buoys, PIRATA surface current mooring, XBT and TSgraph VOS lines, ARGO Profilers, meteorological stations, tide gauges, coastal stations, satellite observations, current meter mooring array at 23°W-Equator, glider...

Many other informations (international collaborations, organization of the TT6, logistical consideration, details on measurements, training, tables summarizing the kinds of measurement and availability, links with modeling studies, potential problems, required enhancements to the LOP/EOP network, actual status of the field program...) can be found in the full text TT6 document by the same authors.



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African Monsoon Multidisciplinary Analyses

1st International Conference

Dakar, 28th November – 4th December 2005

Extended abstracts

Isabelle Genau, Sally Marsh, Jim McQuaid, Jean-Luc Redelsperger,
Christopher Thorncroft and Elisabeth van den Akker (Editors)

AMMA International

Conference organisation:

Bernard Bourles, Amadou Gaye, Jim McQuaid, Elisabeth van den Akker

English and French editing :

Jean-Luc Redelsperger , Chris Thorncroft, Isabelle Genau

Typesetting:

Sally Marsh, Isabelle Genau, Elisabeth van den Akker

Printing and binding:

Corlet Numérique
14110 Condé-sur-Noireau
France
numeric@corlet.fr

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AMMA International Project Office

IPSL/UPMC
Post Box 100
4, Place Jussieu
75252 PARIS cedex 5

Web : <http://www.amma-international.org/>

Email amma.office@ipsl.jussieu.fr

Tel. +33 (0) 1 44 27 48 66

Fax +33 (0) 1 44 27 49 93

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Convective wind system with aerosols, named "haboob", Hombori in Mali, West Africa.