

# **Overview of AMMA region evaluation data and analyses for RCM runs**

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# AMMA project

- **AMMA: African Monsoon Multidisciplinary Analysis**

- **Structure:**

AMMA-EU

AMMA Africa

Several national projects

## GOALS

- **Improve understanding of the West African Monsoon and its influence on the physical, chemical and biological environment, regionally and globally.**

- **Relate variability of the WAM to issues of health, water resources, food security and demography for West African nations**

- **Define and implement monitoring and prediction strategies**

# Overview of AMMA resources

## GENERAL INFORMATION

### **AMMA-EU:**

<https://www.amma-eu.org>

### **AMMA – international coordination:**

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

## DATA AND ANALYSES

### **AMMA database:**

<http://database.amma-international.org/>

### **ALMIP**

[http://www.cnrm.meteo.fr/amma-moana/amma\\_surf/almip/index.html](http://www.cnrm.meteo.fr/amma-moana/amma_surf/almip/index.html)

### **AMMA-MIP**

<http://amma-mip.lmd.jussieu.fr/>

# AMMA observations

## Observation periods

**LOP:** Long term observing period (2002-2010) (interannual variability)

**EOP:** Enhanced observing period (2005-2007) (annual cycle)

**SOP:** Special observing periods

SOP0: January-February 2006 (dry season)

SOP1: 15 May – 30 June 2006 (monsoon onset)

SOP2: 1 July – 14 August 2006 (peak monsoon)

SOP3: 15 August – 15 September 2006 (late monsoon)

# AMMA database

## <http://database.amma-international.org>



[Data Base Home](#)

[New User](#)

[Registration](#)

[Amma Data Policy](#)

[Data Catalogue](#)

[AMMA Instruments sheets /  
Metadata page](#)

[AMMA-SAT & AMMA-MOD](#)

[Other AMMA websites](#)

[Contacts](#)

[Admin \(restricted access\)](#)

This website enables to access AMMA data. If you already own an id, you can access the user interface using the panel Data Access. If it is your first visit, you will have to read and sign the [data policy](#).

**Many local observations and satellite products are already inserted in the database and can be requested by login below.** Then you will have to select geographical domain, time period, parameters...

**But some local observation datasets are only available as the PI provided them.** To search the data please go to the [Data Catalog](#) or to the [Metadata Page](#). Select the dataset you need. Clicking on the green flag will allow you to access the original PI files. In particular radar data are only available in the PI format.

Model and Satellite data are available by ftp too : <ftp://ftp.bddamma.ipsl.polytechnique.fr>

#### Data Access

Username

Password

Dataset to load in the user interface

Login

[\(Forgotten password ?\)](#)

[Change your password](#)

#### Additional information...

[Documentation \(only in french\)](#)  
[AMMA data policy](#)  
[Other AMMA websites](#)

#### If you don't have an ID yet

[Registration](#)  
[Access Free Data](#)

# AMMA database

<http://database.amma-international.org>

## ACCESS TO DATA

### - Registration:

- AMMA-EU license: scientists who are employees of institutions participating in AMMA.

Gives access to historical data available under “pre-existing knowledge clause” (PEKH) clause

- AMMA-Int license: all other scientists

### - Data catalogue:

- Many different platform and dataset types (e.g. aircraft, radar, satellite, ground based observations, flux stations, ....)

# ALMIP

## AMMA Land surface Model Intercomparison Project

- **Offline simulations** with many land surface models
- **Consistent gridded dataset of atmospheric, soil and surface variables**

### FORCING DATA

- LSMs forced with atmospheric data (combined ECMWF analysis/satellite observations database)
- Precipitation satellite observations: high resolution in space and time (0.5°, 3-hourly)
  - EPSAT: Estimation of Precipitation by SATellite (developed within AMMA)
  - TRMM-3B42

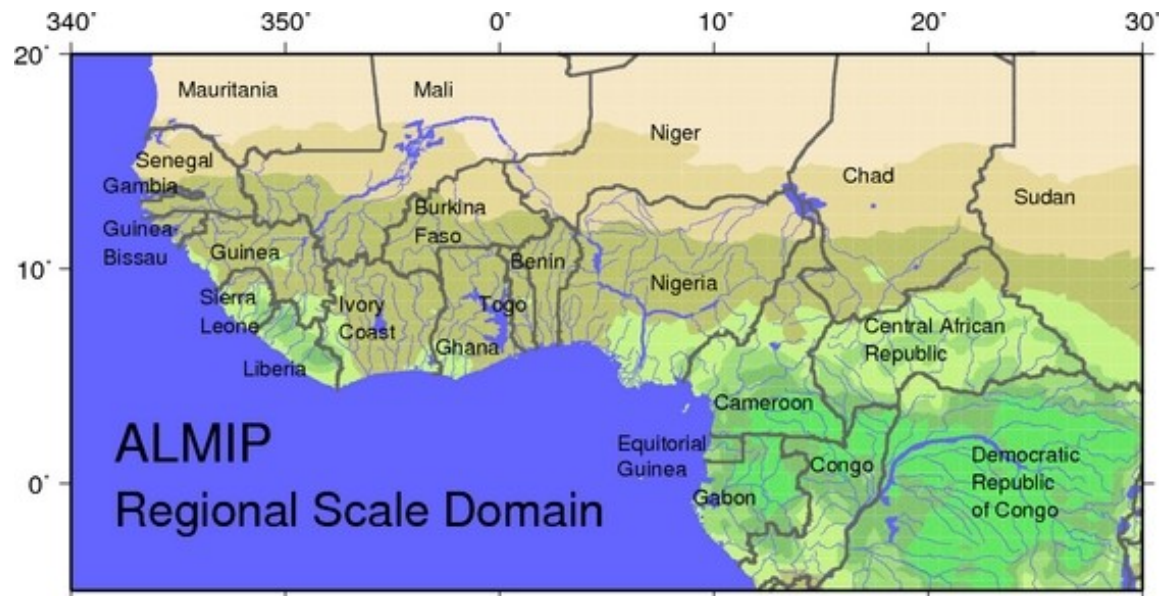
# ALMIP

## AMMA Land surface Model Intercomparison Project

### OUTPUT DATA

- Period: 2002-2007(last experiment)
- Multi-model dataset of soil moisture and temperature, surface fluxes, water and energy budget diagnostics at the surface

**DOMAIN**



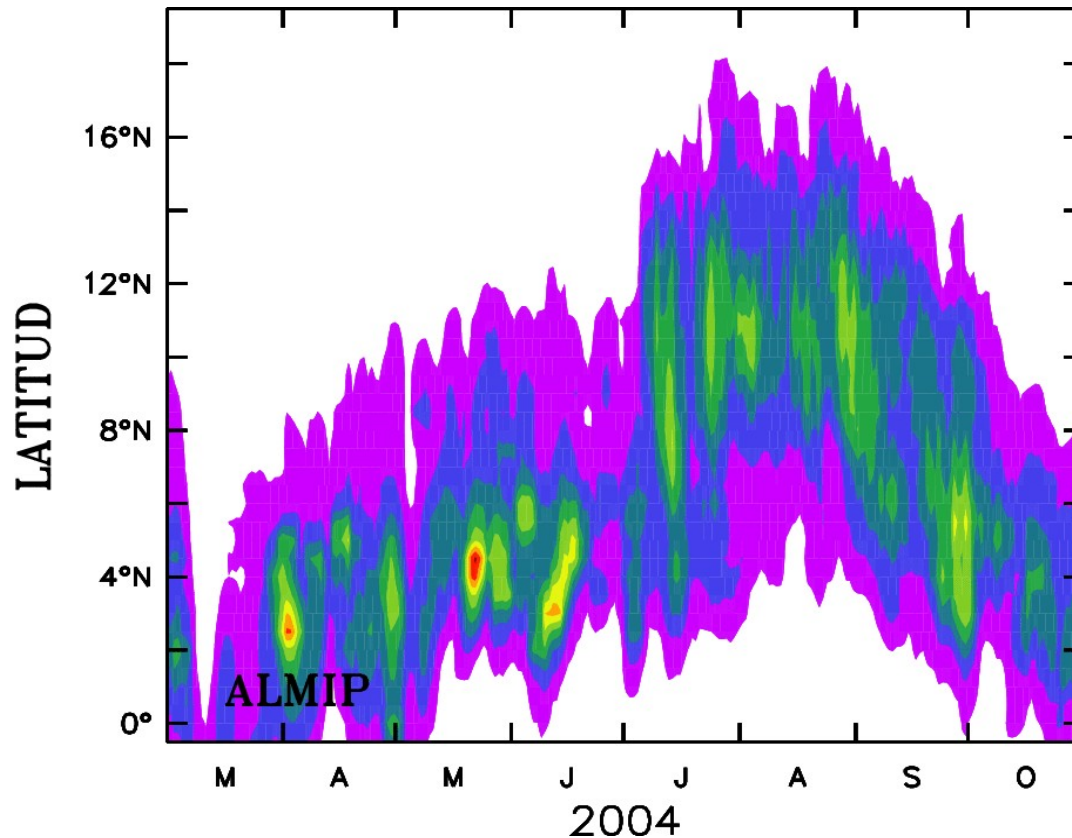


# AMMA-MIP

## AMMA Model Intercomparison Project

### MODEL OUTPUT ANALYSES

- Mean latitudinal structure of the monsoon
  - Time-latitude precipitation diagrams (zonal average 10°W-10°E)

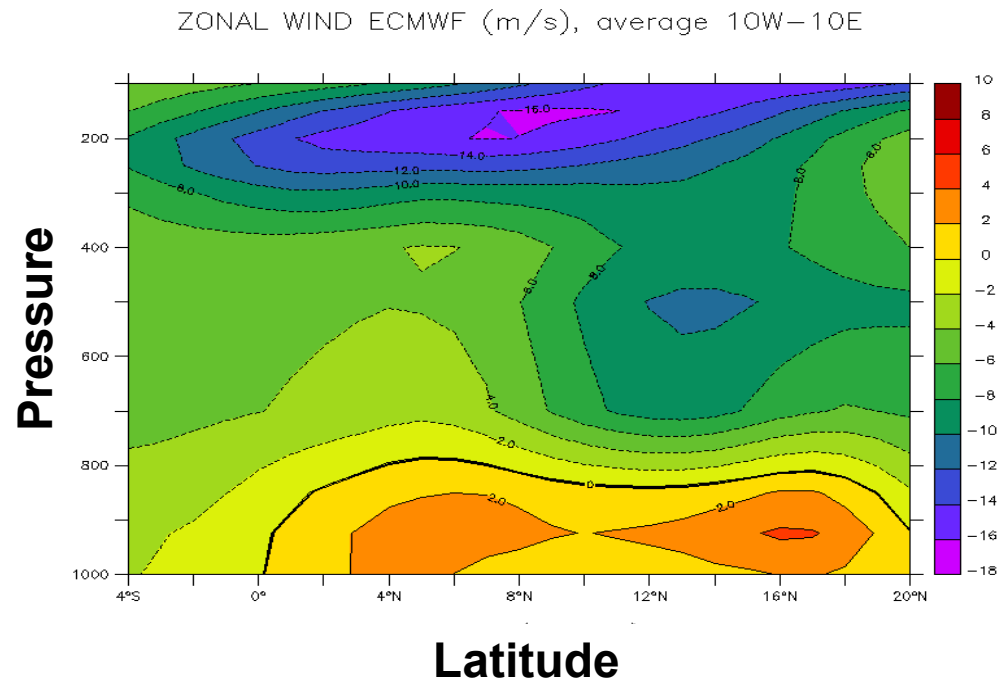


# AMMA-MIP

## AMMA Model Intercomparison Project

### MODEL OUTPUT ANALYSES

- Mean latitudinal structure of the monsoon
  - Vertical cross sections of zonal wind (zonal average)

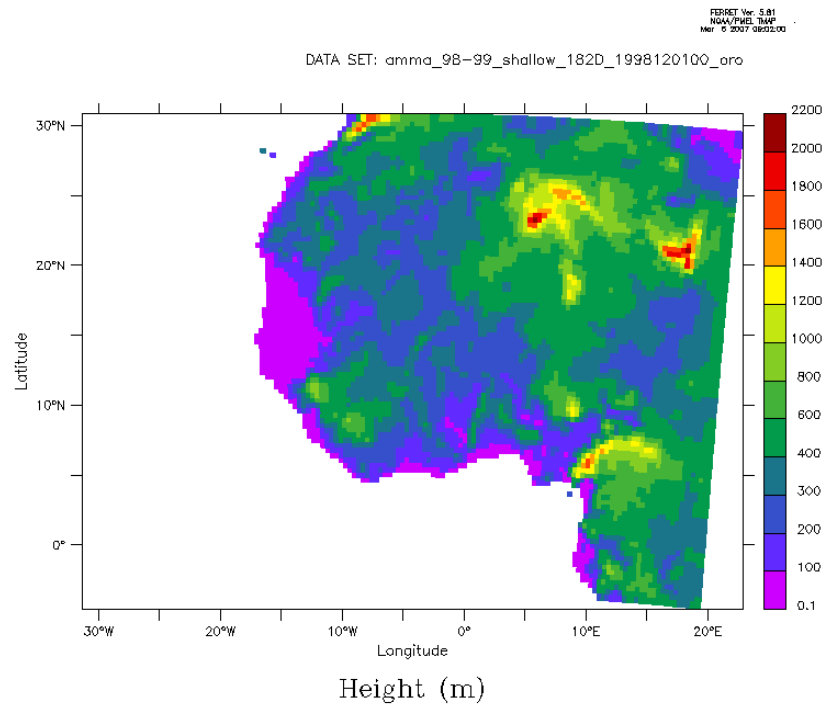


- Longitudinal structures: e. g. African Easterly Waves

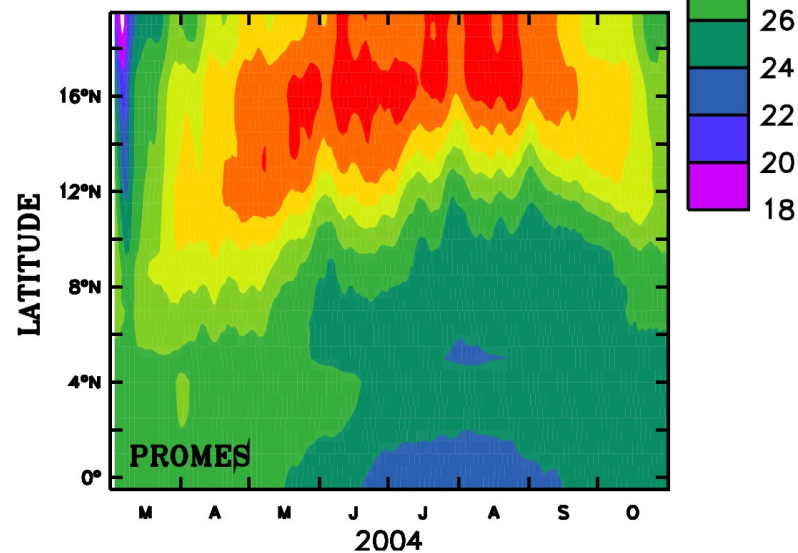
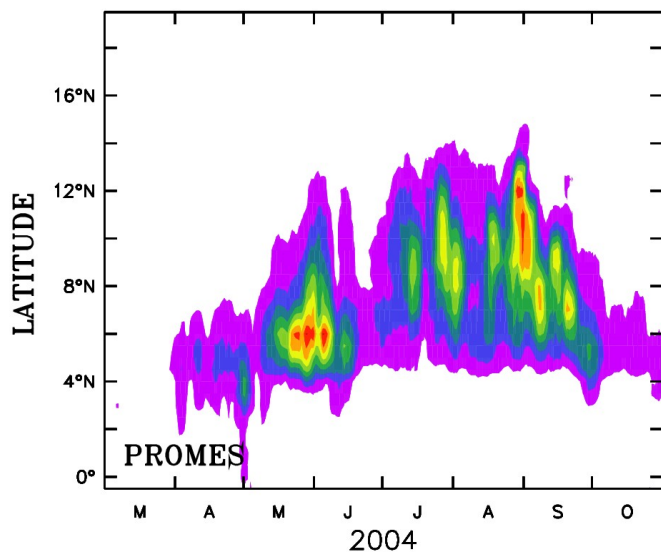
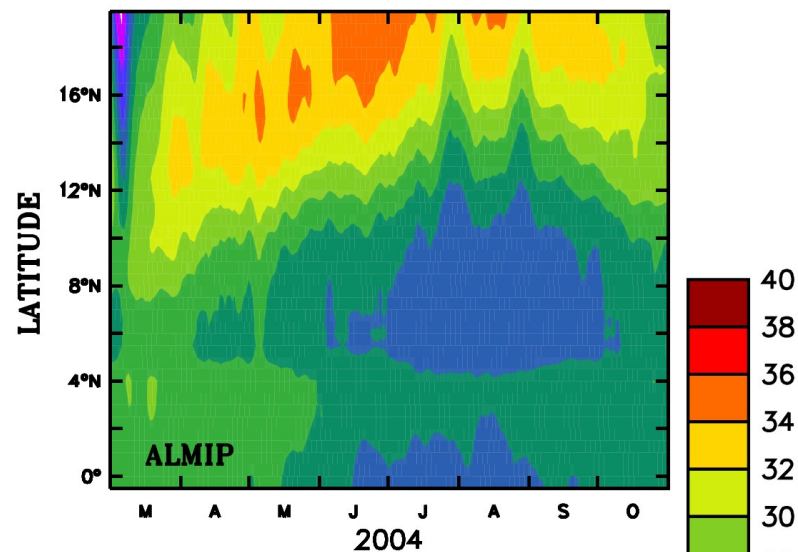
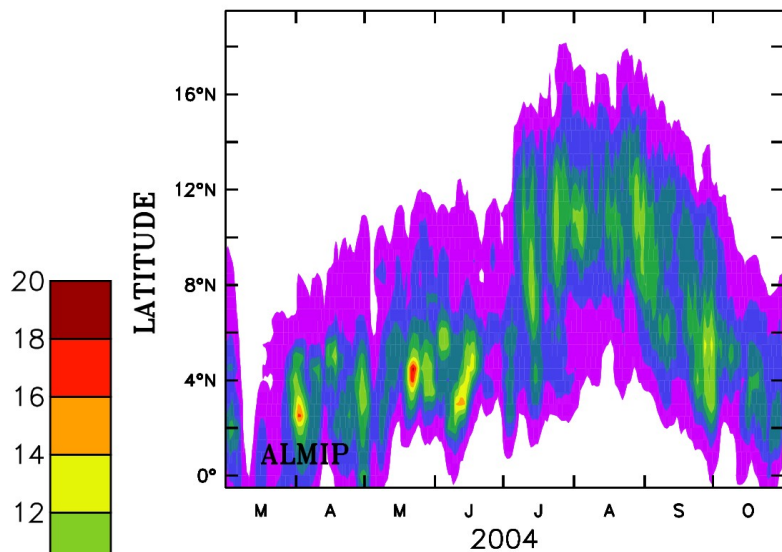
# APPLICATION OF ALMIP DATA FOR MODEL ANALYSIS

- PROMES model, nested in ECMWF analysis
- Period: 2000-2006
- Coupled to ORCHIDEE land-surface model

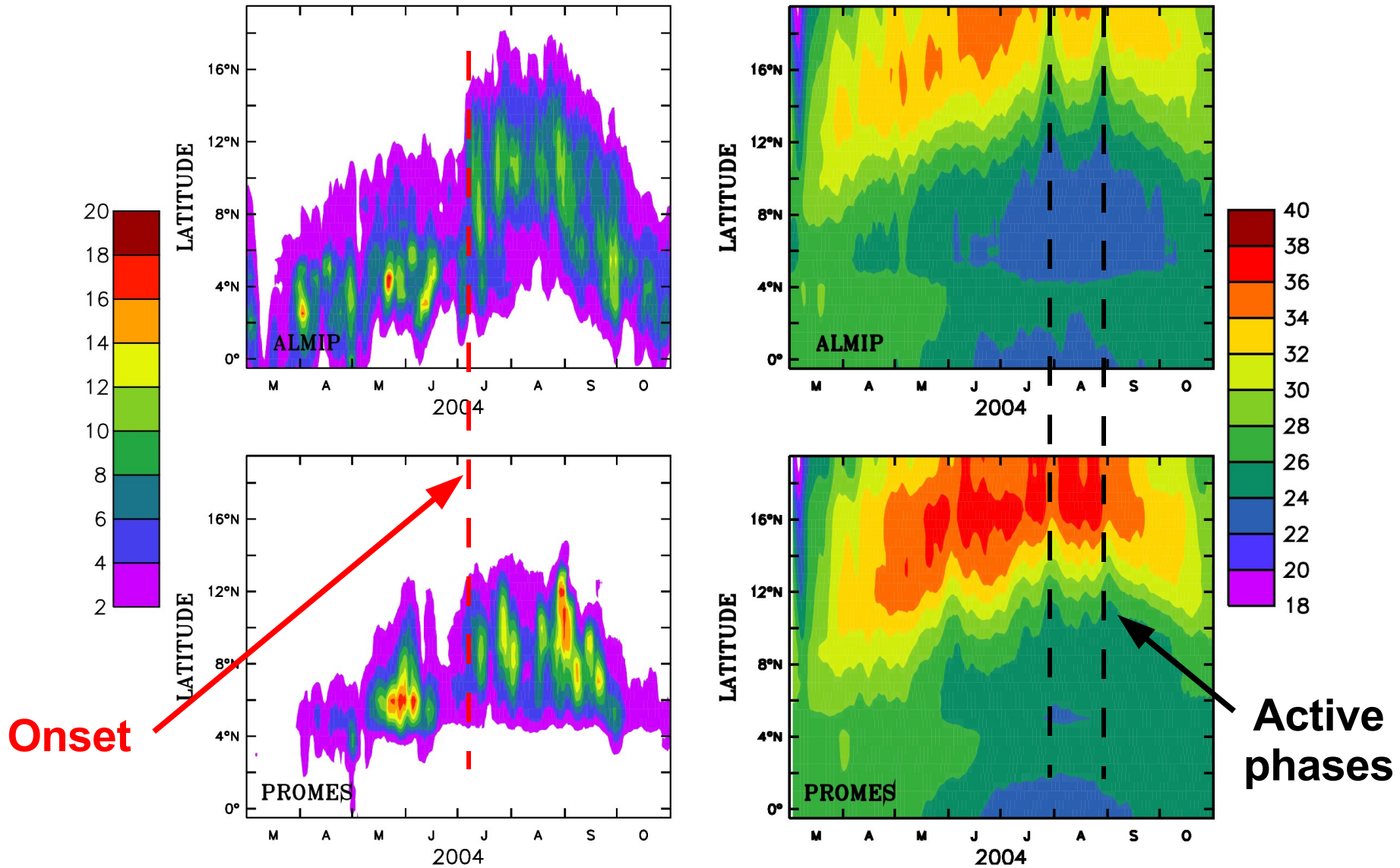
**Domain (height in m)**



# Time – latitude diagrams (precipitation and temperature)

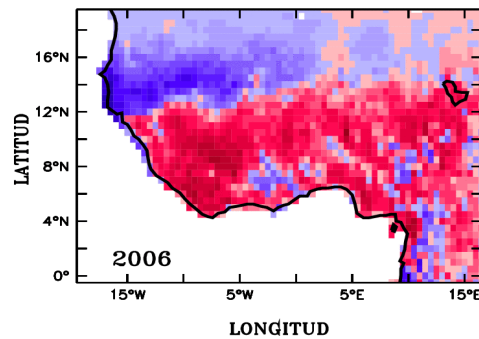
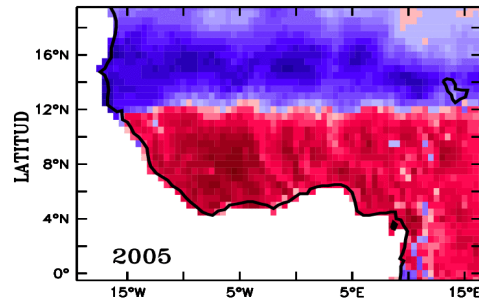
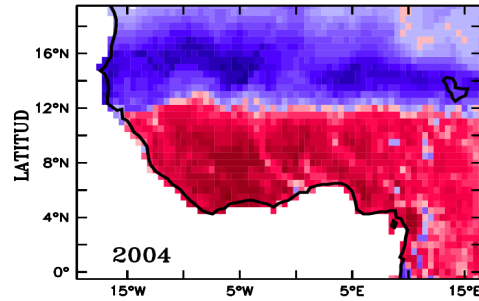


# Time – latitude diagrams (precipitation and temperature)

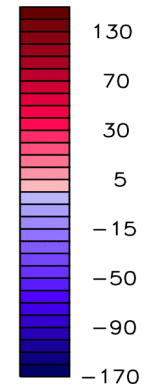
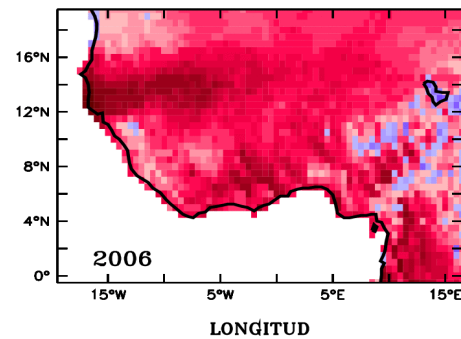
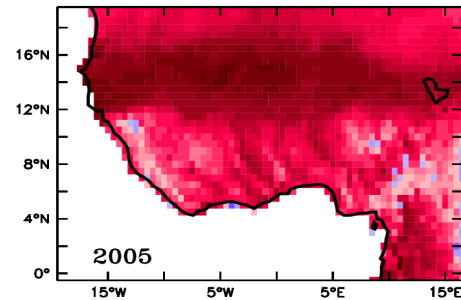
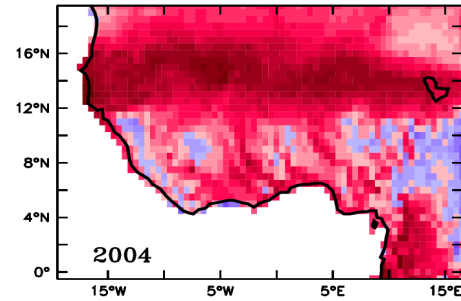


# Use of ALMIP land surface fluxes

## Latent heat bias



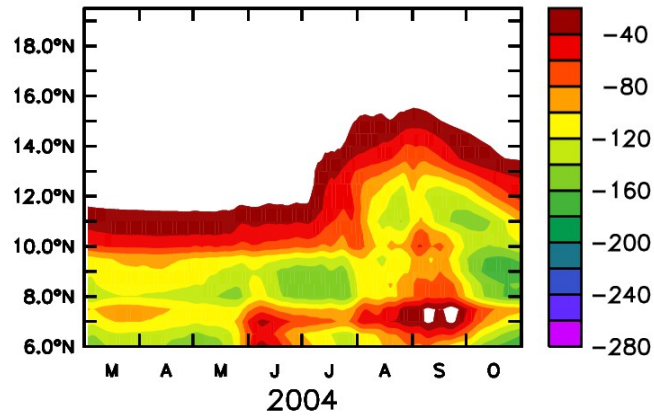
## Sensible heat bias



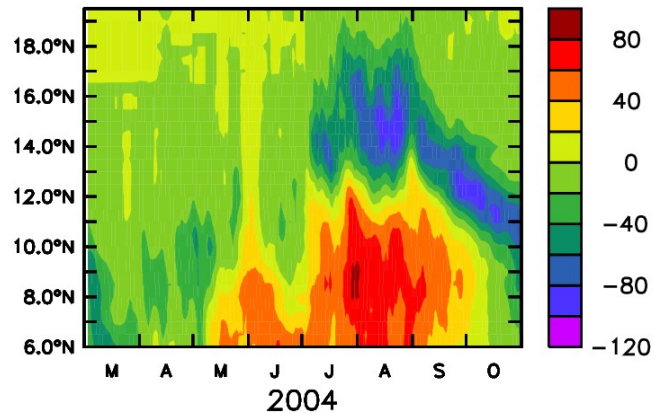
**“Biases”:  
PROMES –  
ALMIP values**

# Soil moisture and precipitation biases

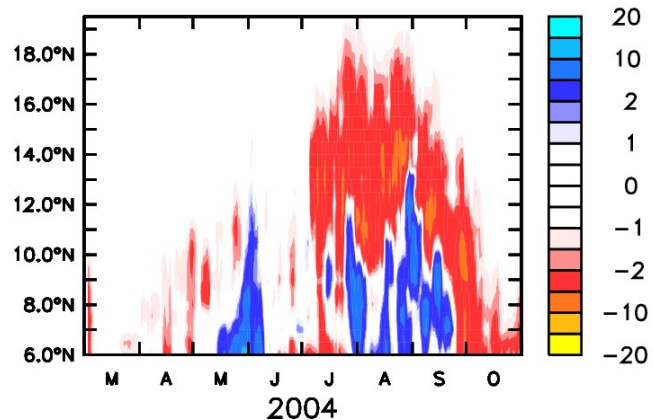
Soil moisture bias  
(mm)



Latent heat bias  
(W/m<sup>2</sup>)



Precipitation bias  
(mm)

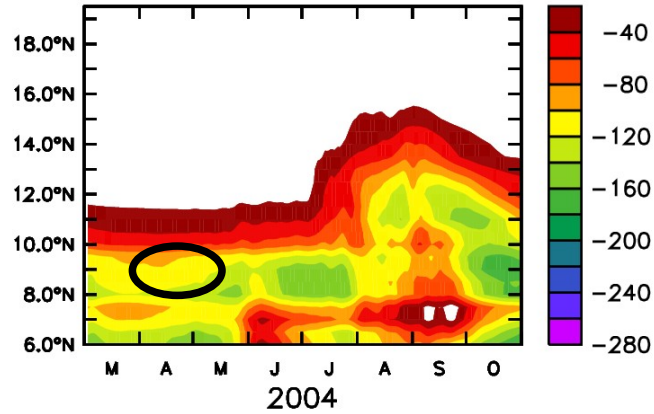


**“Biases”:**  
**PROMES – ALMIP**  
**values**

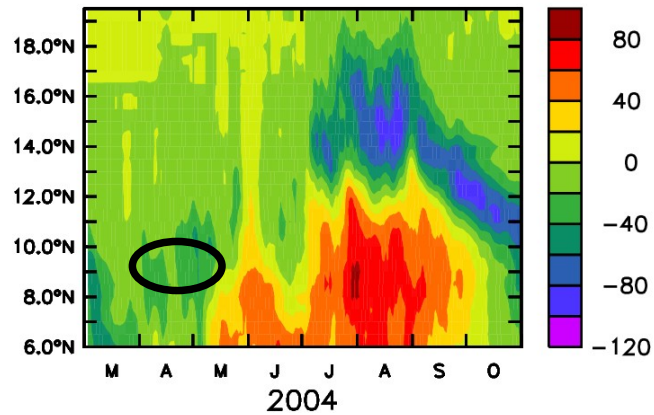
# Soil moisture and precipitation biases

Until May:

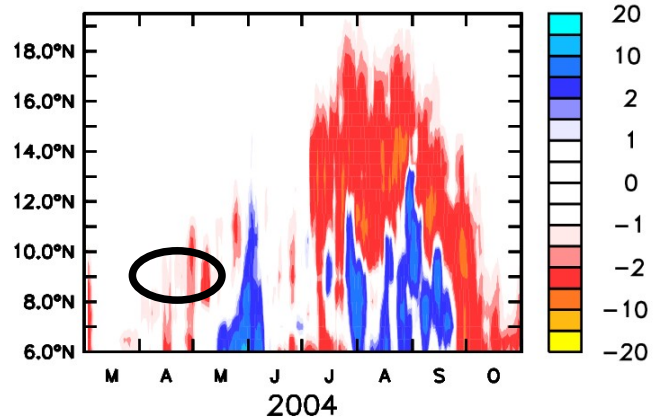
Negative SM bias



Negative LH bias



Slight negative prec. bias



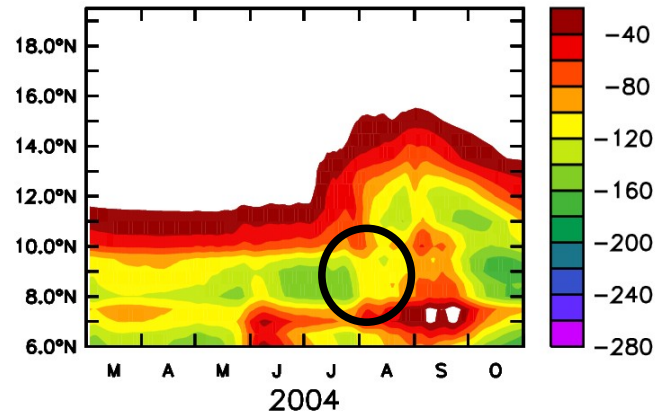
**Local influence of drier soils on spring convection**



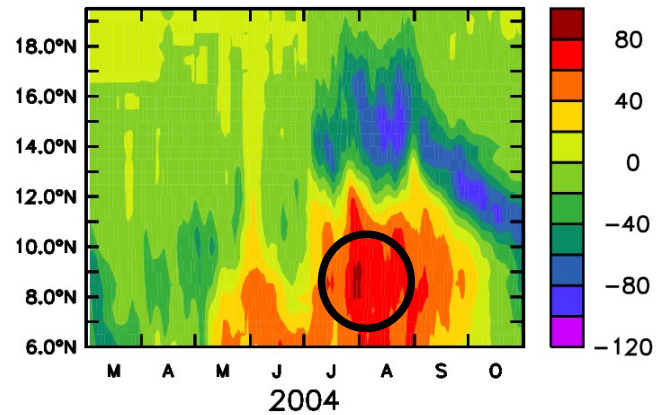
# Soil moisture and precipitation biases

Monsoon period:

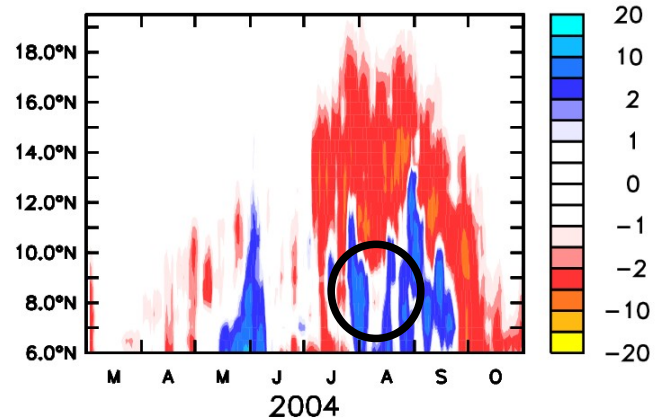
Negative SM bias



Positive LH bias !



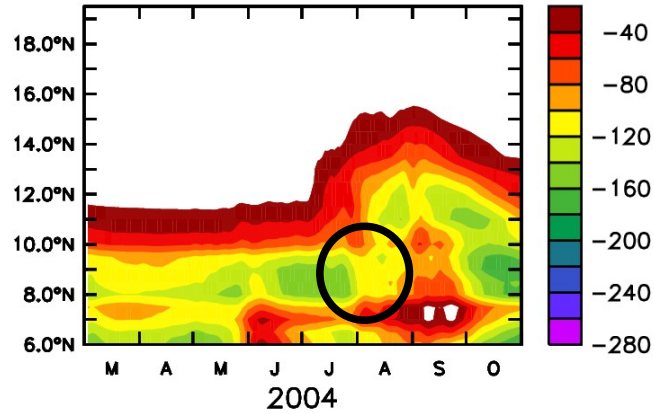
Mostly positive precipitation bias



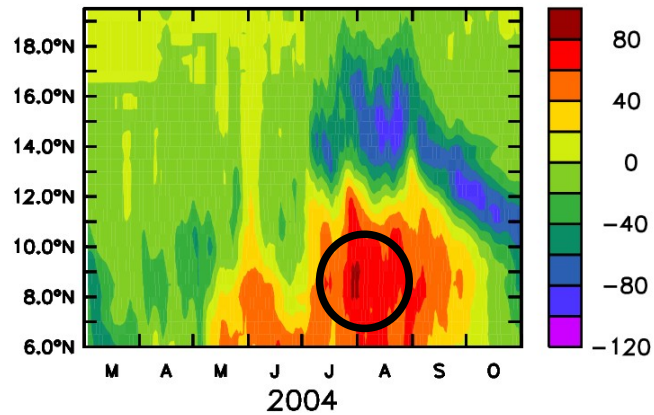
# Soil moisture and precipitation biases

Monsoon period:

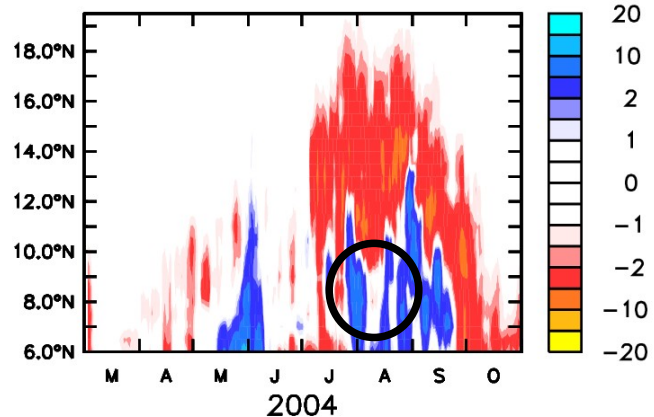
Negative SM bias



Positive LH bias !



Mostly positive precipitation bias



**Likely reason:  
positive shortwave  
radiation bias**

## Future meetings

- AMMA may propose a joint session with ENSEMBLES at the Lund workshop (May) (TO BE CONFIRMED)
- Participation of AMMA impact groups