WP4.1 Model evaluation and data assimilation

Workpackage number	4.1	**Start date or starting event:**			M25		
Participant id		ENEA					
Person-months per participant:		1./0					

Objectives
To coordinate the project within the WP in close collaboration with other WPs To ensure that subWPs develop the activities related to the model intercomparison. To support the interactions between the dynamical models and the chemical/aerosols models

Description of work
Organize subWPs meetings needed to develop the work or to solve specific problems Development of the interactions with the other WPs involved in the modelling evaluation and improvement (more specifically with WP5.1, 1.1, 1.2, 1.3, 2.1). Development of the interaction with international initiatives aimed to improve models skill over the WAM area.

Deliverables
Progress reporting occurs through the Scientific Management WP (7.2).

Milestones
M4.1a : Progress reports (M30,M36,M42)

sWP 4.1.1 Data assimilation and forecasting systems

Workpackage number	4.1.1			**Start date or starting event:**		M25
Participant id	ECMWF	CEH	CNRS	CNRM	UPCT	UPS
Person-months per participant:	2/0	12/3	10/0	26.75/0	1/0	1/0

Objectives
– assessment of the Land Surface Models skills (inter-comparison). Coordination of land surface modeling will be supported by AMMA LSM Inter-comparison Project (ALMIP) at different spatial scales from local to meso and regional scales. ALMIP involves AMMA-EU and AMMA-API participants of WPs 4.1**.** – Understanding of the impact of land-surface conditions on forecasts.

Description of work

Land data assimilation :

- In terms of ALDAS development, testing of the new CNRM (SURFEX: EXternalized SURFace) land-surface assimilation system over West Africa and comparison to the existing operational soil moisture initialization system will begin. Note that this item depends heavily on the progress of the development of the assimilation system using the CNRM-SURFEX land surface scheme (which is not directly related to AMMA). (June 2008, Milestone)

Land surface model inter comparison:

- production of soil moisture data by long-term land surface integrations in off line mode. Target years 2004-2005. A first experiment using satellite derived precipitation and radiation data (AMMA exp1). A second experiment (AMMA exp 2) using the analysed forcing (July 2007, Milestone, ECMWF).
- ALMIP I:

  1. Analysis and inter comparison of the ALMIP results. Workshop tentatively planned for May, 2007. (May 2007, Milestone, ALMIP group)

  2. At least one publication will follow (preparation summer, 2007): participants will be encouraged to submit additional publications related to this work. (September 2007, Milestone, ALMIP group).

  3. Preparation of the deliverable *The ALMIP Final Report* will be done after the workshop (May-June, 2007). This report will cover the regional scale simulations and intercomparison. (June 2007, Deliverable, ALMIP group)
- ALMIP II (extension of the ALMIP initiative to the period 2006-2007):

  1. Regional scale merged (combined NWP and satellite based) atmospheric forcings covering the period 2006 (notably the SOP) will be made available in early 2007. (May 2007, Milestone, ALMIP group)

  2. Development of the mesoscale atmospheric forcing database. This database will be built for 2004-2005 while relying heavily on the LAND-SAF satellite-based radiative products, and the EPSAT precipitation product as they are available at a 0.10 degree spatial and 1 hour temporal resolutions via Medias and the AMMA-DataBase. Work will also begin on the 2006 data focusing on the SOP period. (September 2007, Milestone, ALMIP group)

  3. Local scale SVAT/LSM simulations and model intercomparison work is to begin near the latter part of 2007. (December 2007, Milestone, ALMIP group)
- ALMIP Collaborations

  1. Certain land surface state diagnostics from the ALMIP project will be provide to the AMMA-Cross project. These will then be used to evaluate the performance of the surface schemes in the fully-coupled (surface-atmosphere) GCM run analysis. (June 2007, Milestone, ALMIP group)
- 2. The land surface state will be simulated by the CNRM SVAT for 2006 (covering the SOP). Surface evapotranspiration estimations will be provided to the water budget analysis group, and collaborations with this group will be intensified during 2007. The evapotranspiration product simulated by other ALMIP schemes (in addition to CNRM) may also be contributed if such schemes elect to simulate the year 2006 in early 2007. The needed input forcing data will be made available to all ALMIP models (September 2007, Milestone, ALMIP group)

  3. Collaboration with the International GEWEX-sponsored WAMME (West African Monsoon Modelling and Evaluation project) project. Regional scale ALMIP results for 2004-2005 will be used to evaluate the simulations of the land surface state by a number of NWP models involved in WAMME (December 2007, Milestone, ALMIP group).

Significant Risks, Contingency Plan :

The availability of the regional scale merged (combined NWP and satellite based) atmospheric forcing covering the period 2006 depends on the predicted availability date of the EPSAT satellite-based precipitation product: so that the timing of the completion of this item depends on the EPSAT product delivery date. The merged mesoscale and local scale experiments covering the SOP period depend on the timely delivery of needed forcing and evaluation data (e.g. surface fluxes for local scale model evaluation) at a research-quality level to the AMMA-DB.

Deliverables

Few changes, respect to the DOW, have been made in order to comply with the goal of detecting the main model deficiencies.

D4.1.1.f : ALMIP final report (CNRM, ECMWF,CEH,UPCT,UPS) (M30)

Milestones

M411_May07a Workshop on ALMIP I results (CNRM, ECMWF,CEH,UPCT,UPS)

M411_May07b ALMIP II regional merged atmospheric forcing (CNRM, ECMWF,CEH,UPCT,UPS)

M411_Jun07b ALMIP collaboration: land surface diagnostics for AMMA-MIP (CNRM, ECMWF,CEH,UPCT,UPS)

M411_Jun07c Methods will be developed to assimilate land surface temperature from Meteosat Second Generation data into the JULES land surface scheme (CEH)

M411_Jul07 Soil moisture data base (ECMWF)

M411_Sep07a ALMIP I paper submission (CNRM, ECMWF,CEH,UPCT,UPS)

M411_Sep07b ALMIP II mesosocale atmospheric forcing (CNRM, ECMWF,CEH,UPCT,UPS)

M411_Sep07c ALMIP collaboration: evapotranspiration for water budget group (CNRM, ECMWF,CEH,UPCT,UPS)

M411_Dec07a ALMIP II simulation beginning (CNRM, ECMWF,CEH,UPCT,UPS)

M411_Dec07b ALMIP collaboration: regional data for WAMME (CNRM, ECMWF,CEH,UPCT,UPS)

M411_Jun08 ALDAS assimilation test (CNRM, ECMWF,CEH,UPCT,UPS)

WP4.1.2 The West African Monsoon in regional and global climate models

Workpackage number	4.1.2		**Start date or starting event:**		M25	
Participant id	ECMWF	ENEA	CNRS	CNRM	UCM	
Person-months per participant:	4/4	6/3	15/0	8.75/0	6/2	

Objectives

To diagnose the simulations of the seasonal cycle and of the intra-seasonal variability over the WAM in climate models. The first inter-comparison will focus on the years 2000 and 2003, and extended to the year 2006 (field campaign)

To identify the most relevant deficiencies in climate models for simulating the WAM variability (seasonal and intra-seasonal). This analysis will allow us to identify the parameterization's problems.

Description of work

The AMMA-MIP initiative will be promoted in order to gather as many model's outputs as possible, for the target years, 2000 and 2003.

- Inclusion in the AMMA-MIP data set of the the day 1, 5 and 10 operational ECMWF forecasts for the years 2000, 2003 and 2006 and of a climate-type run with the ECMWF model (March 2007, Milestone, ECMWF).

The main diagnostic activities planned for the first AMMA-MIP phase will be completed: the analysis of the WAM (seasonal , and intra-seasonal) variability for a latitudinal-height cross-section (1) and for horizontal slabs of the troposphere (2). The focus of the cross-section evaluation and inter-comparison will be on the latitudinal extent of the WAM system, jumps and breaks of monsoon rainfall, and their relation with the mean meridional circulation, penetration of the monsoon flow, strength of the Saharian heat low, surface fluxes, etc ... The idea of the cross-section is inheritated from the EUROCS cross-section over Eastern Pacific (Siebesma et al., 2004). The cross-section will consist in zonal averages of model outputs taken from 10W to 10E. The latitudinal domain will be 20S-40N. The second part (tropospheric horizontal slab), has two main objectives: the first one is to evaluate the ability of the models to reproduce the synoptic phenomena and in particular those related to the easterly waves, there relation with convection, jet intensity and so on.

The inter comparison will be extended to the years 2005-2006.

Deliverables

Few changes, respect to the DOW, have been made in order to comply with the goal of detecting the main model deficiencies.

D4.1.2.b : First intercomparison of models based on the WAM diagnostics: seasonal cycle and intra-seasonal variability. CNRM, CNRS, ENEA, UCM (M30)

D4.1.2.c : Sensitivity to soil moisture in the global forecasting model. ECMWF (36)

D4.1.2.d : AMMA-MIP report for years 2005-2006. CNRM, CNRS, ENEA, UCM (42)

Milestones

M412_Feb07 A web form in the AMMA data-base for collecting the "foreign" simulations

M412_Feb07 Definition of new runs for years 2005-2006

M412_Apr07 deadline for models delivery for the intecomparison deliverable due in june.

M412_Sep07 summary of discussions on the possible direct use of all available soudings and surface and aircraft flux meausrements for AMMAMIP (in collaboration with the other AMMA-WPs and WAMME.

sWP 4.1.3 Modelling the interactions between aerosols/chemistry and the atmosphere

Workpackage number	4.1.3		**Start date or starting event:**		M25
Participant id	KNMI	CNRM	CNRS	LMU	
Person-months per participant:	3/0	46.5/0	25/0		

Objectives

To evaluate the capability of existing models (global and regional, coupled and off-line) to represent the 3D distribution of aerosols and trace gases over West Africa.

Description of work

Applying the different models to the AMMA region

Performing numerical experiments to generate model output for comparison with existing observations, in order to test different (1) aerosol representations, (2) atmospheric transport and chemistry representations, (3) descriptions of sources / sinks of aerosols and trace gases, band (3) coupling schemes of atmospheric composition with dynamics

Comparing of the model output with observed, particularly the field campaign data, aerosol and trace gas distributions and assessing model skills

Deliverables

Few changes, respect to the DOW, have been made in order to comply with the goal of detecting the main model deficiencies.

D4.1.3.c : First intercomparison of current CTMs and CCMs models for the years 2000 and 2003: comparison with dynamical models – KNMI, CNRS, CNRM (M30)

D4.1.3.d : Report on CTMs and CCMs inter-comparison for year 2006 – KNMI,CNRS, CNRM, LMU (M42)

Milestones

M413_Mar07 Definition of new runs for year 2006, and idealized passive tracers experiments

M413_Nov07 Submission of a paper on the first CTMs, CCMs inter-comparison

M413_Dec07 Gathering of the year 2006 simulations

M413_Apr08 Gathering of the simulations using idealized passive tracers

WP4.1 Gantt chart

WP	4.1	Leader :	ENEA	Partners

	Time	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	
M4.1c	Progress reports																			
D4.1.1.f	ALMIP final report																			*CNRM,* ECMWF,CEH,UPC
M411_May07a	Workshop on ALMIP I results																			*CNRM,* ECMWF,CEH,UPC
M411_May07b	ALMIP II regional merged atmospheric forcing																			*CNRM,* ECMWF,CEH,UPC
M411_Jun07b	ALMIP collaboration: land surface diagnostics for AMMA-MIP																			*CNRM,* ECMWF,CEH,UPCT,
M411_Jun07c	*Methods will be developed to assimilate land surface temperature from Meteosat Second Generation data into the JULES land*																			
M411_Sep07a	ALMIP I paper submission																			*CNRM,* ECMWF,CEH,UPC
M411_Sep07b	ALMIP II mesosocale atmospheric forcing																			*CNRM,* ECMWF,CEH,UPC
M411_Sep07c	ALMIP collaboration: evapotrans. For water budget gropu																			*CNRM,* ECMWF,CEH,UPC
M411_Dec07a	ALMIP II simulation beginning																			*CNRM,* ECMWF,CEH,UPC
M411_Dec07b	ALMIP collaboration: regional data for WAMME																			*CNRM,* ECMWF,CEH,UPC
M411_Jun08	ALDAS assimilation test																			*CNRM,* ECMWF,CEH,UPC
D4.1.2.b	First intercomparison of models based on the WAM diagnostics: seasonal cycle and intra-seasonal variability.						D4.1.2.b													ECMWF ENEA CNRS CNRM UCM
D4.1.2.c	Sensitivity to soil moisture in the global forecasting model																			ECMWF
D4.1.2.d	AMMA-MIP report for years 2005-2006																			CNRM, CNRS, ENEA, UCM
M412_Feb07a	A web form in the AMMA data-base for collecting the "foreign" simulations																			WP4.4
M412_Feb07b	Definition of new runs for years 2005-2006																			CNRM, CNRS, ENEA, UCM
M412_Apr07	deadline for models delivery for the intecomparison deliverable due in june.																			CNRM, CNRS, ENEA, UCM
M412_Sep07	*summary of discussions on the possible direct use of all available soudings and*																			CNRM, CNRS, ENEA, UC
M412_Dec07	Paper on first AMMA-MIP inter-comparison to be sent																			CNRM, CNRS, ENEA, UC
M412_Jan08	AMMA-MIP runs for years 2005-2006 available																			CNRM, CNRS, ENEA, UC
D4.1.3.c	First intercomparison of current CTMs and CCMs models for the years 2000 and 2003: comparison with dynamical models																			KNMI,CNRS,LMU,CNRM
D4.1.3.d	Report on CTMs and CCMs inter-comparison for year 2006																			KNMI,CNRS,LMU,CNRM
M413_Mar07	Definition of new runs for year 2006, and idealized passive tracers experiments																			KNMI,CNRS,LMU,CNRM
M413_Nov07	Submission of a paper on the first CTMs, CCMs inter-comparison																			KNMI,CNRS,LMU,CNRM
M413_Dec07	Gathering of the year 2006 simulations																			KNMI,CNRS,LMU,CNRM
M413_Apr08f	Gathering of the simulations using idealized passive tracers																			KNMI,CNRS,LMU,CNRM

WP4.1 Resources

WP4.1.1 ECMWF, CNRS, CNRM, UPCT, UPS, CEH

Scientist	Partner	Expertise (supervisor for young scientist)	Funded by AMMA-EU (y/n)	p.m. (total/requested)	Contribution to WP
Chris Taylor	CEH	Land surface modelling	Y	6/3	Assimilation of satellite data into JULES
Phil Harris	CEH	Land surface modelling	N	6/0	Assimilation of satellite data into JULES
JP Lafore	CNRM	Convection modelling	N	3.75/0	Evaluation of the impact of the assimilation
M Nuret	CNRM	Data assimilation, satellite processing	N	12.75/0	Data assimilation for AMMAEM
Gerard E	CNRM	Atmospheric modelling (supervisor M Nuret)	N	5.25/0	Production of simulations
A Boone	CNRM	Surface Modelling	N	12.75/0	ALMIP: development of soil moisture assimilation
Karbou F	CNRM	Modelling	N	3.75/0	Modelling and analysis
Moll P	CNRM	Modelling	N	3.75/0	Modelling and analysis
Payan C	CNRM	Modelling	N	3.75/0	Modelling and analysis
Poli P	CNRM	Modelling	N	1/0	Modelling and analysis
F Hourdin	CNRS	Global modelling	N	5/0	Simulations with LMDZ
L Fairhead	CNRS	Global modelling	N	5/0	Simulations with LMDZ
P DeRosnay	UPS-CESBIO	Land surface modelling	N	1/0	ALMIP coordination and development of soil moisture assimilation in Orchidee
Alain BAILLE	UPCT	Land surface modelling	N	1/0	Hydrological modelling for WAM
Anna Agusti-Paraneda	ECMWF	Assimilation and modelling	Y	9/9	Land surface assimilation and observational analysis
Gianpaolo Balsamo	ECMWF	Assimilation and modelling	Y		Land surface assimilation and observational analysis
Anton Beljaars	ECMWF	Assimilation and modelling	Y		Land surface assimilation and observational analysis
Adrian TompKins	ECMWF	Assimilation and modelling	Y		Land surface assimilation and observational analysis

WP4.1.2 ECMWF, CNRS, CNRM, ENEA, UCM

Scientist	Partner	Expertise (supervisor for young scientist)	Funded by AMMA-EU (y/n)	p.m. (total/requested)	Contribution to WP
Foujeau JP	CNRM	Global modelling	N	2/0	Simulations with Arpege
F. Guichard	CNRM	Global modelling	N	5.25/0	Simulations with Arpege
JP Lafore	CNRM	Global modelling	N	1.5/0	Simulations with Arpege
F Hourdin	CNRS	Global modelling	N	5/0	Simulations with LMDZ
I Musat	CNRS	Global modelling	N	5/0	Simulations with LMDZ
JY Grandpeix	CNRS	Global modelling	N	5/0	Simulations with LMDZ
PM Ruti	ENEA	General Circulation of the Atmosphere	Y	3/1.5	Performing simulations with ECHAM4 – Statistical analysis
A. Dell'Aquila	ENEA	General Circulation of the Atmosphere (supervisor PM Ruti)	Y	3/1.5	Performing simulations with ECHAM4 – Statistical analysis
Teresa Losada Doval	UCM	Statistical Climatology	Y	2/2	Performing simulations with UCLA GCM – Statistical analysis
Javier García Serrano	UCM	Statistical Climatology	N	1/0	Performing simulations with UCLA GCM – Statistical analysis
Belluno Rodríguez de Fonseca	UCM	Climate Dynamics	N	2/0	Performing simulations with UCLA GCM – Statistical analysis
Helsa Mohino Harris	UCM	Climatologies	N	1/0	Performing simulations with UCLA GCM
Anna Agusti-Paraneda	ECMWF	Assimilation and modelling	Y	4/4	ECMWF model evaluation

WP4.1.3

KNMI, CNRS, CNRM, LMU

Scientist	Partner	Expertise (supervisor for young scientist)	Funded by AMMA-EU (y/n)	p.m. (total/requested)	Contribution to WP
Peter van Velthoven	KNMI	Ozone global model	Partial	3/0	Modeling nitrogen oxides and ozone.
F Houdin	CNRS	Global modeling	N	5/0	Simulations with LMDZ
ATTIE JL.	CNRS-LA	Ozone – Global model	Y	2/0	Global chemistry transport model MOCAGE with assimilated CO from MOPITT – Ozone budget
MARI C.	CNRS-LA	Ozone – Mesoscale model	Y	4/0	Mesoscale model Meso-NH – Focus on lightning NO_X emissions and convective transport
MASCART P.	CNRS-LA	Ozone – Mesoscale model	Y	4/0	Mesoscale model Meso-NH – Focus on lightning NO_X emissions and convective transport
PINTY JP.	CNRS-LA	Ozone – Mesoscale model	Y	4/0	Mesoscale model Meso-NH – Focus on lightning NO_X emissions and convective transport
PONT V.	CNRS-LA	Aerosols – Mesoscale and regional climate model	Y	4/0	Modeling of aerosol mixing and radiative properties with a mesoscale model (Meso-NH) and a regional climate model (RegCM3)
SERCA D.	CNRS-LA	COV – Mesoscale model	Y	2/0	Modeling of the impact of biogenic NO_X and COV using the mesoscale model Meso-NH
Beau I	CNRM	Modelling	N	5.25/0	Modelling and analysis
Beucher F	CNRM	Modelling	N	5.25/0	Modelling and analysis
Courreux F	CNRM	Modelling	N	7.5/0	Modelling and analysis
Deque M	CNRM	Modelling	N	1/0	Modelling and analysis
Douville E	CNRM	Modelling	N	1/0	Modelling and analysis
Gueremy JP	CNRM	Modelling	N	1.5/0	Modelling and analysis
Josse B	CNRM	Modelling	N	5.25/0	Modelling and analysis
Lafore JP	CNRM	Modelling	N	1.5/0	Modelling and analysis
Marquet P	CNRM	Modelling	N	5.25/0	Modelling and analysis
Peuch V	CNRM	Modelling	N	1.5/0	Modelling and analysis
Pollack D	CNRM	Modelling	N	5.25/0	Modelling and analysis
Royer JP	CNRM	Modelling	N	1/0	Modelling and analysis
Tulet P	CNRM	Modelling	N	5.25/0	Modelling and analysis