Project No: 603502

DACCIWA

"Dynamics-aerosol-chemistry-cloud interactions in West Africa"

Deliverable

D8.4 Special session

Due date of deliverable:	31/07/2017		
Completion date of deliverable:	25/07/2017		
Start date of DACCIWA project:	1st December 2013	**Project duration:**	60 months
Version:	[V1.0]		
File name:	[D8.4_SpecialSession_DACCIWA_v1.0.pdf]		
Work Package Number:	**8**		
Task Number:	**4**		
Responsible partner for deliverable:	**UPS**		
Contributing partners:	**UREAD, UNIVLEEDS**		
Project coordinator name:	Prof. Dr. Peter Knippertz		
Project coordinator organisation name:	Karlsruher Institut für Technologie		

The DACCIWA Project is funded by the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 603502.

Dissemination level		
PU	Public	**x**
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Nature of Deliverable		
R	Report	**x**
P	Prototype	
D	Demonstrator	
O	Other	

DOCUMENT INFO

Authors

Author	Beneficiary Short Name	E-Mail
Celine Mari	UPS	celine.mari@aero.obs-mip.fr
Peter Hill	UREAD	p.g.hill@reading.ac.uk
John Marsham	ULEEDS	J.Marsham@leeds.ac.uk
Véronique Yoboué	Université de Cocody (Abidjan) Ivory Coast	yobouev@hotmail.com

Changes with respect to the DoW

Issue	Comments
Coordination with BACCHUS	No coordination was done with BACCHUS for this EGU session due to the shift in DACCIWA campaign which lead to a different agenda and maturity between the two projects. The BACCHUS community was advised about this session.

Dissemination and uptake

Target group addressed	Project internal / external
Scientific community	external

Document Control

Document version #	Date	Changes Made/Comments
0.1	18.05.2017	Template with first structure
0.2	22.06.2017	Version with input from all special session convenors.
0.3	04.07.2017	To be approved by the DACCIWA general assembly
1.0	24.07.2017	Approved by the DACCIWA general assembly

Table of Contents

1 Introduction

The annual European Geosciences Union (EGU) general assembly brings ca. 14,000 geoscientists from across the world together in Vienna for a week-long conference. This year's assembly took place from 23-28 April 2017 and – for the first time – included a session focused specifically on the atmosphere of Sub-Saharan Africa, which was organised by DACCIWA scientists (Convener: Céline Mari; Co-Conveners: John Marsham, Peter Hill, Véronique Yoboué)

The session was entitled 'Atmospheric composition, weather and climate in Sub-Saharan Africa' and attracted a total of 58 abstracts (many involving DACCIWA scientists) on a wide range of topics relevant to Sub-Saharan Africa, including atmospheric chemistry, aerosols and associated health impacts, dynamical meteorology, clouds, and precipitation. As a result the session was allocated 18 oral and 40 poster (one late withdrawal) presentations.

2 Focus of the session

This session was open to a wide range of contributions on atmospheric sciences in Sub-Saharan Africa, with a focus on tropical regions. This included work based on field observations (campaign, long-term), satellite remote sensing and numerical models as well as work targeting socio-economic implications of atmospheric phenomena.

Contributions were invited on various relevant topics including:
* dynamical meteorology;
* atmospheric chemistry, aerosols and associated health impacts
* cloud microphysics and precipitation
* climate variability and change
* radiative processes

One focus of the session was the DACCIWA project and its large international field campaign in June-July 2016 in southern West Africa.

Young scientist/student presentations were especially encouraged and we reserved several oral slots for such papers in this session.

3 Implementation of the session

The oral session began with an overview of the DACCIWA project by Peter Knippertz (Figure 1) and from there moved through talks on atmospheric dynamics, clouds, precipitation, and the boundary layer, to talks on pollution, aerosols and atmospheric composition. The poster session was well-attended and included some very high quality posters. Table 1 below gives an overview of the diverse research topics covered in the session. Table 2 and Table 3 list the talks and posters. A full list of presentations including abstracts is available on the EGU website at http://meetingorganizer.copernicus.org/EGU2017/session/24727.

The session was advertised through all networks available to the DACCIWA community including social media. During the session talks were documented through twitter.

Figure **1**: Overview talk of the DACCIWA coordinator Peter Knippertz

Figure **2**: A number of talks described observations made during the aircraft field campaign. Here Joel Brito details how aircraft measurements are being used to investigate how anthropogenic emissions affect secondary organic aerosol formation.

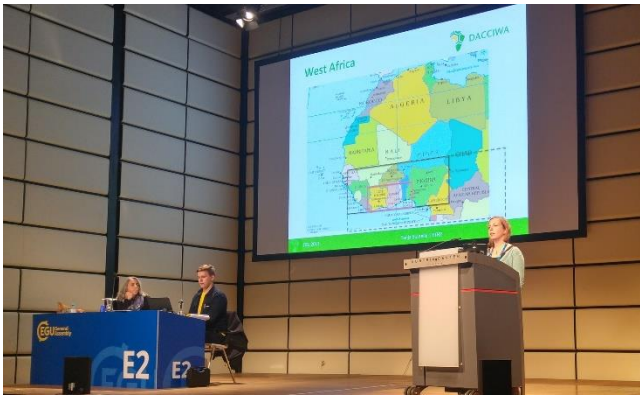

Figure **3**: There were also a number of DACCIWA talks on atmospheric modelling. In her talk, Tanja Stanelle described how different aerosol emissions inventories impact on a climate model.

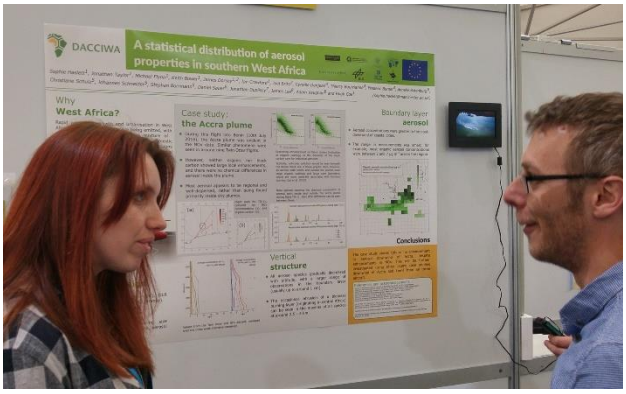

Figure **4**: The poster session provided an opportunity for further in-depth discussions.

Table 1: List of presentation topics in the session. Note that each presentation may be included in multiple categories

Category/Topic	# Oral presentations	# Poster presentations
Aerosols	5	9
Atmospheric composition	7	15
Boundary layer	2	8
Clouds	2	11
Dynamical meteorology	3	10
Health	1	1
Rain	3	8
Modelling	5	18
Observations	12	24
Female	11	12
Male	7	28
Early career scientists	10	20

Table 2: List of talks (DACCIWA affiliation in green)

Titel	Presenter	Affiliation
The DACCIWA project: Dynamics-aerosol-chemistry-cloud interactions in West Africa	Peter Knippertz	Karlsruher Institute of Technolgy (DE)
A Survey of Synoptic Waves over West Africa	Yuan-Ming Cheng	University at Albany (USA)
Skilful prediction of Sahel summer rainfall on inter-annual and multi-year timescales	Katy Sheen	University of Exeter (UK)
Properties of low-level clouds during the DACCIWA aircraft campaign derived from remote sensing and airborne measurements	Jonathan Taylor	University of Manchester (UK)
Characteristics of mid-level clouds over West Africa	Elsa Bourgeois	CNRS/Météo-France (FR)
Extreme flooding in the West African cities of Dakar and Ouagadougou – atmospheric dynamics and implications for flood risk assessments	Andreas Fink	Karlsruher Institute of Technolgy (DE)
Relating rainfall characteristics to cloud top temperatures at different scales	Cornelia Klein	Centre for Ecology and Hydrology (UK)
Evolution of the atmospheric boundary layer in southern West Africa – an overview from the DACCIWA field campaign	Norbert Kalthoff	Karlsruher Institute of Technolgy (DE)
The evolution of nocturnal boundary-layer clouds in southern West Africa – a case study from DACCIWA	Bianca Adler	Karlsruher Institute of Technolgy (DE)
Origin, extend and health impacts of air pollution in Sub-Saharan Africa	Susanne E. Bauer	Columbia University (USA)
Changing distributions of carbon monoxide (CO) over Africa from climate and land use driven fire patterns	Helen Worden	NCAR, UCAR (USA)
Air pollution in Southern West Africa: Impact of different emission inventories	Tanja Stanelle	ETH Zürich
Highly-controlled, reproducible measurements of aerosol emissions from African biomass combustion	Sophie Haslett	University of Manchester (UK)
Aircraft-borne aerosol chemical composition measurements in the lower to middle troposphere over southern West Africa: Biomass burning, urban outflow plumes, and long-range transport.	Anneke Batenburg	Max Planck Institute for Chemistry (DE)
On the impact of anthropogenic emissions on biogenic SOA formation above West Africa: results from DACCIWA aircraft field campaign	Joel Brito	Université Clemont Auvergne (FR)
Simulation of West African air pollution during the DACCIWA experiment with the GEOS-Chem West African regional model.	Eleanor Morris	University of York (UK)
Measurements of NO and NH3 soil fluxes at the Savé super site in Benin, West Africa, during the DACCIWA field campaign.	Federica Pacifico	University of Toulouse (FR)

Table 3: List of poster presentations (DACCIWA affiliation in green)

Titel	Presenter	Affiliation
Handheld sun photometer measurements in Southwestern Africa: results from Benin and Ivory Coast.	Jean-François Leon	University of Toulouse (FR)
Physico-chemical characterization of African urban aerosols (Abidjan in Cote d'Ivoire and Cotonou in Benin) and their toxic effects in human bronchial epithelial cells during the dry season 2016.	Jacques Adon	University of Toulouse (FR)
African Anthropogenic Emissions Inventories for gases and particles from 1990 to 2016	Catherine Liousse	University of Toulouse (FR)
Observations of biogenic isoprene emissions and atmospheric chemistry components at the Savé super site in Benin, West Africa, during the DACCIWA field campaign.	Corinne Jambert	University of Toulouse (FR)
Anthropogenic plumes from metropolitan areas and biomass burning emissions in West Africa during DACCIWA – airborne measurements on board the DLR Falcon 20	Greta Stratmann	DLR (DE)
Transport and Vertical Distribution of Urban Pollutants over the Guinean Gulf	Adrien Deroubaix	University Pierre et Marie Curie (FR)
Impact of vegetation fires on tropospheric chemical composition in the Guinean Gulf and on megacities air quality.	Laurent Menut,	University Pierre et Marie Curie (FR)
Sensitivity of the southern West African mean atmospheric state to variations in low-level cloud cover as simulated by ICON	Anke Kniffka	Karlsruher Institute of Technolgy (DE)
Impact of long-range transport pollution on aerosol properties over West Africa: observations during the DACCIWA airborne campaign	Cyrielle Denjean	Meteo-France (FR)
Measurement of air pollutant emissions from Lome, Cotonou and Accra	James Lee	University of York (UK)
Chemistry-clouds interactions over West Africa: the role of moist thermals on the atmospheric oxidation capacity	Fabien Brosse	University of Toulouse (FR)
Study of the mixing and ageing of polluted plumes from major West Africa cities	Flore Tocquer	University of Toulouse (FR)
Surface factors governing the stratocumulus breakup and evolution in southern West Africa: A LES study	Xabier Pedruzo-Bagazgoitia	University of Toulouse (FR)
Nocturnal low-level jet and low-level cloud occurrence over Southern West Africa during DACCIWA campaign	Cheikh Dione	University of Toulouse (FR)
The nocturnal low-level jet in theWest African Sahel from observations, analyses, and conceptual models	Geoffrey Bessardon	University of Leeds (UK)
Is there a clear relationship between the Tropical Easterly Jet and Sahel rainfall?	Alexander Lemburg	Max Planck Institute of Meteorology (DE)

Titel	Presenter	Affiliation
COSMO-PAFOG: Three-dimensional fog forecasting with the high-resolution COSMO-model	Maike Hacker	University of Bonn (DE)
Forecasting the atmospheric composition of southern West Africa with COSMO-ART during the DACCIWA measurement campaign	Konrad Deetz	Karlsruher Institute of Technolgy (DE)
A mini backscatter lidar for airborne measurements in the framework of DACCIWA	Patrick Chazette	LSCE-LMD (FR)
The statistical distribution of aerosol properties in sourthern West Africa	Sophie Haslett	University of Manchester (UK)
Examining High/Low Variability Forecasts of African Easterly Waves in the ECMWF Ensemble Prediction System	Travis Elless	University of Albany (US)
Impact of Low Level Clouds on radiative and turbulent surface flux in southern West Africa	Fabienne Lohou	University of Toulouse (FR)
Quantifying Cloud Aerosol Interactions in Southern West Africa	Phil Rosenberg	University of Leeds (UK)
Identification and Diagnosis of Rainfall Types over Southern West Africa Using Satellite and Rain Gauge Data	Marlon Maranan	Karlsruher Institute of Technolgy (DE)
Observations of cross-Saharan transport of water vapour via cycle of cold pools and moist convection	Tomasz Trzeciak	Met Office (UK)
A multisatellite climatology of clouds, radiation, and precipitation in southern West Africa and comparison to climate models	Peter Hill	University fo Reading (UK)
Overview of the DACCIWA ground-based field campaign in southern West Africa	Fabienne Lohou	University of Toulouse (FR)
Quantifying the contribution of different cloud types to the radiation budget in southern West Africa during the monsoon season	Peter Hill	University fo Reading (UK)
The DACCIWA 2016 radiosonde campaign in southern West Africa	Andreas H. Fink	Karlsruher Institute of Technolgy (DE)
Assessing GPM products quality on extreme rainfall event	Jean Claude Berges	PRODIG (FR)
Statistical forecasting for precipitation over West Africa based on spatio-temporal precipitation properties and tropical wave activity	Peter Vogel	Karlsruher Institute of Technolgy (DE)
Nocturnal boundary layer observations in Kumasi during the DACCIWA field campaign	Geoffrey Bessardon	University of Leeds (UK)
Impacts of the land-lake breeze of the Volta reservoir on the diurnal cycle of cloudiness and precipitation	Marcel Buchholz	Karlsruher Institute of Technolgy (DE)
The relative importance of water vapour and dust in controlling the variability in radiative heating of the summertime Saharan heat low	John H. Marsham	University of Leeds
Modulation of precipitation over West Africa by equatorial waves	Andreas Schlüter	Karlsruher Institute of Technolgy (DE)

Titel	Presenter	Affiliation
The BAOBAB data portal and DACCIWA database	Guillaume Brissebrat	Centre National de la Recherche Scientifique (FR)
Representation of the West African Monsoon System in the aerosol-climate model ECHAM6-HAM2	Tanja Stanelle	ETH Zurcih
Why do global climate models struggle to represent low-level clouds in the West African summer monsoon?	Peter Knippertz	Karlsruher Institute of Technolgy (DE)
The DACCIWA model evaluation project: representation of the meteorology of southern West Africa in state-of-the-art weather, seasonal and climate prediction models	Anke Kniffka	Karlsruher Institute of Technolgy (DE)

4 Conclusion

With a large number of DACCIWA scientists in attendance, the session was an excellent forum for discussing progress within the project. A large number of non-DACCIWA scientists also took part in the session, providing a valuable opportunity both to advertise DACCIWA science to the wider research community and to learn about other ongoing research in the region. Based on the success of this session, we plan to repeat it at EGU in April 2018.