

MISSION EXPERTS DIVISION (EOP-SM)
DIRECTORATE OF EARTH OBSERVATION PROGRAMMES

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From M. Berger (EOP-SML)		Telephone: +31 71 565 5158 Fax: +31 71 565 5675
To Members of the SMOS Science Advisory Group (distribution list attached) Dr. G. Lagerloef, Earth and Space Research, Seattle, WA, USA Dr. D. Le Vine, NASA GSFC, Greenbelt, MD, USA Dr. T.J. Jackson, USDA ARS Hydrology Lab, Beltsville, USA Dr. M. Drusch, ECMWF, Reading, UK Dr. J. Grandell, EUMETSAT, Darmstadt, D		e-mail: Michael.Berger@esa.int
c.c.: <ul style="list-style-type: none"> ESRIN: V. Liebig (D/EOP), S. Briggs (EOP-S), W. Lengert (EOP-GM), J. Benveniste (EOP-SER), N. Wright (EOP-GDM), P. Goryl (EOP-GOQ), R. Crapolicchio ESTEC: R. Zobl (EOP-P), E.A. Herland (EOP-SM), M. Rast (EOP-SML), E. Attema (EOP-SMS), N. Floury (TEC-EEP), P. Wursteisen (EOP-SMS), M. Martin-Neira (TEC-ETP), P. Baptista (TEC-EEP), H. Rebhan (EOP-SMO), A. Hahne (EOP-PS), M. Drinkwater (EOP-SMO), S. Delwart (EOP-PEL), M. Zundo (EOP-PEP), E. Dinnat (EOP-SMO), M. Rijkeboer (EOP-SML), C. Garrido (EOP-PE), J.-P. Huot (TEC-EES), P. van Oevelen (EOP-SML), R. Bianchi (EOP-SMS) 		
Subject: Minutes of the 16th SMOS SAG Meeting held at ESA-ESRIN, Frascati, Italy, 2 & 3 December 2004		

Dear Colleague,

Enclosed you will find the minutes of the sixteenth SMOS SAG meeting held at ESA-ESRIN, Frascati, Italy, 2 and 3 December 2004. Please note that this document is also available in PDF format for downloading on the SMOS SAG ftp server. The version on the ftp site also contains the presentation viewgraphs used during the meeting.

The next SAG meeting will take place on 5 & 6 April 2005 at ESTEC combined with the Final Presentation of the SMOS Retrieval Study will take at ESTEC on 4 April 2005. A separate invitation will be sent to you in due time.

Yours sincerely,
 Dr. M. Berger
 Land/Surfaces Unit
 Mission Experts Division

MINUTES OF THE
SIXTEENTH
SOIL MOISTURE AND OCEAN SALINITY (SMOS) MISSION
SCIENCE ADVISORY GROUP MEETING

2 & 3 December 2004

ESA ESRIN, Frascati, Italy

Participants

SAG: Y. Kerr (YK), J. Font (JF), P. Waldteufel (PhW), M. Peichl (MP), N. Skou (NS), E. Anterrieu (ErA), I. Corbella (IC), N. Reul (NR), J. Grandell (JG), T. Jackson (TJ), A. vd. Griend (AvdG), M. Drusch (MDr), P.Y. LeTraon (PYT), B. vd. Hurk (BvdH), D. LeVine (DLV), G. Lagerloef (GL)

Excused: W. Wagner (WW), D. Stammer (DS), C. Mätzler (CM)

ESA: A. Hahne (AH), P. Wursteisen (PW), M. Zundo (MZ), S. Delwart (SD), JP. Huot (JH), N. Wright (NW), J. Benveniste (JB), H. Rebhan (HR), E. Dinnat (ED), R. Crapolicchio, P. Goryl, R. Bianchi, P. v. Oevelen, M. Berger (MB)

List of Recommendations:

No :	Description/description
R16.1	<i>The SAG strongly recommends to initiate a study to improve the assimilation of soil moisture fields/brightness temperature fields in NWP's.</i>

List of Actions:

description/description	action/action	due date/date butoir
send draft ATBDs to the SAG	16.1: ESLs	April
to provide preliminary results of the IVT-4 to the SAG	16.2: MMN	asap
to clarify Biscay flight pattern and ship tracks - and to optimise flight plan for CoSMOS	16.3: PW	asap
to assess the time needed for data pre-processing of radiometer and scatterometer data obtained during CoSMOS	16.4: NS	15 Jan
to distribute the draft SMOS validation document to the SAG	16.5: ESA	31 Jan
to forward SMOS AO schedule to higher management and to seek coordination with NASA program managers	16.6: ESA	28 Feb
to include calib sequence as an agenda point at the next SAG meeting - to discuss F. Cabot's assessment	16.7: MB	31 Mar
to send IC MTR reports of the IR study	16.8: MB	done
to draft IR chapter	16.9: IC	31 Dec
to provide feedback on chapter 1-4	16.10: YK/JF	31 Dec
to finalise draft of chapter 5	16.11: MB/HR	31 Dec
to distribute SSR content list	16.12: MB	asap
to draft chapter 8	16.13: AH	31 Dec
to draft chapter 9	16.14: NW	31 Dec
to draft chapter 10	16.15 YK/MB	31 Dec
to check ECMWF wind-field spatial resolution as expected by 2007	16.16 MDr	31 Jan

1. **Welcome and Introduction – Objectives of the Meeting – Approval of Draft Agenda**

MB, YK and JF welcomed the SAG to their 16th meeting.

Objectives of the meeting were:

- to re-capitulate the findings of the 5th WS,
- to update the group with the status of the study and campaign activities,
- to introduce national activities,
- to discuss the next steps of the Science Report, and
- to discuss requirements to furthering Soil Moisture assimilation techniques.

The draft agenda was agreed and is attached below.

2. **Actions from the Last Meeting**

Actions from the last meeting were reviewed and their status updated:

<i>description/description</i>	<i>action/action</i>	<i>due date/date butoir</i>
To organise a CoSMOS exp. meeting—timeframe autumn 2004	15.1: PW	Sept/Oct
To comment the SMOS User Model as distributed by AH	15.2: SAG	9 July
To provide test data to be transformed to the ISEA/Snyder grid / to send the transformed data to the SAG for further analysis	15.3: NR/MZ	15 July
To analyse the test data and to report to ESA	15.4: SAG	15 Sept
To analyse impact of 30 deg beamwidth for CoSMOS	15.5: YK/PhW	30 Aug
To provide feedback on the sun correction processing scheme	15.6: SAG	30 Sept
To provide information on the FIN SM measurement network	15.7: JG	1 Aug
To provide point of contacts in Africa for the SMOS validation	15.8: JG	1 Aug
To provide information on the Nilhu database to the SAG	15.9: PW	30 Aug

description/description	action/action	due date/date butoir
To provide the contact points of key scientist responsible for major measurements networks (to be added to the SMOS WS distribution list)	15.10: WW	1 Aug

Remarks:

Action 15.10: open

3. Project Status – PDR-M, GS Prep. Activities, MDPP, and HUT-2D

AH reported on the status of the project.

An ESA/CNES MoU was signed by the directors, an agreement with CDTI is still pending. With the agreement (expected by mid Dec) a formal release of funds for the PDGS Phase C/D is being expected.

The Industry Policy Committee (IPC) has approved the procurement of the ROCKOT launcher for SMOS end of November. Level-2 prototype processor competitive tenders are currently under evaluation. Kick-off is planned for beginning 2005 assuming an Adjudication Committee (AC) agreement in December.

The payload development activities are advancing smoothly and according to plan (see viewgraphs for details).

The image reconstruction study with the aim to downselect two algorithms for implementing into L1 processor is coming to an end. Inputs are required for Phase-2 of the engineering part of the L1 processor development.

The specifications for operational algorithm in the framework of the L2 prototype processors for soil moisture and ocean salinity (ATDBs) are expected by mid 2005. Level-3 and -4 processor developments (national developments by France and Spain) are in the initial phases. The HUT 2D instrument is currently in the final phase of manufacturing / assembly / testing (aircraft certification for HUT aircraft obtained) and first test flights are planned for first half of 2005.

Aircraft certification for MIRAS-A (airborne) being assembled from the 12 LICEF receivers / NIR / CAS / DICOS items from the MDPP-1/2 projects has been achieved. MIRAS-A hardware will first be used for some additional image validation tests in an anechoic chamber. It is being planned to perform first test flights in summer 2005.

4. *Level-1/2 Processor Development Status*

MZ and SD reported on the status of the Level-1 and Level-2 processor development.

MZ reported that the Level-1 processor development is in Phase C/D now. Software coding has started. Following the final presentations of the Image Reconstruction Study planned for mid February two different image reconstruction algorithms will be selected for implementation. MZ provided a detailed description of the data definition (for details please see viewgraphs).

SD reported on the preparation of the L2 prototype processor developments. A competitive tender involving scientific Expert Support Laboratories managed by the SMOS Lead Investigators was issued. ESLs are responsible for generating the ATBDs and for detailed testing. Draft ATBDs will be provided to the SAG for reviewing.

Proposals received in response to the ITT are currently under evaluation. At the time of writing the meeting minutes, the Soil Moisture L2 Prototype Processor Study has been awarded to Array Ltd, a software company located in Canada. A first progress meeting is planned for February.

5. *Findings of the 5th Workshop*

YK reported on the outcome of the 5th SMOS Workshop.

The 5th WS was organised at ESRIN, Frascati. More than 90 scientists, including key-US-scientists of the Aquarius and Hydros mission discussed in splinters open scientific questions. It was recommended that ESA management should inform NASA about the schedule of the planned SMOS cal/val and data AOs. This would allow NASA programme managers to make appropriate planning to support US scientists participating in the SMOS AOs.

In the plenary session it was concluded that a workshop of the current format is not appropriate any longer in particular considering that the Project is now in Phase C/D and that study and campaign activities addressing open scientific questions are underway. A better involvement of the 'end-user communities' at the next WS is envisaged. A joint SMOS-Aquarius-Hydros WS in the timeframe spring 2006 is being planned.

6. *Studies and Campaigns*

The status of the various study and campaign activities was given by the technical officers/study managers.

DOMEX:

PW reported that preparations are complete for the Dec '04-Jan '05 DOMEX Antarctic L-/C-band radiometer campaign. The Campaign Implementation Plan was consolidated, and equipment were tested, calibrated and shipped in mid-November. The field campaign experiment team (comprising two persons) departed at the end of November and are expected at Dome-C beginning December. The first week will comprise installation of the radiometer instrumentation on an existing tower, and testing of the mobile communications link to computers situated in an indoor laboratory. First results are expected for the next SAG meeting.

CoSMOS:

The status of the CoSMOS preparation was given by PW, too. The 2nd CoSMOS experimenters meeting took place in October. Main objectives were to fine-tune the experimenters' plan according to the available campaign budget. Core site for SM is the Toulouse area and for OS the Gulf of Biscay. All other sites are considered as opportunity sites and served according to the available budget.

The Convair-580 owned by Environment Canada will be the instrument carrier. Instrument development has been started and first test-flight of the refurbished EMIRAD L-band radiometer is scheduled for April next year.

Canadian scientists expressed their strong interest in participating in the campaign. Following this the Canadian Space Agency considers to further financially support the CoSMOS campaign in addition to the transit flights of the Convair-580 from Canada to Europe.

US scientists expressed their strong interest in the campaign and their willingness to support the campaign by providing additional soil moisture probes to the ground measurement teams.

IR Study:

MP reported that the assessment of the different image reconstruction techniques is on-going. The final presentation had to be postponed to February 2005 (which is still in time for the Level-1 processor activity).

Due to the intensive processing time needed by SEPS, it was decided to use the much faster CERFACS tools for the simulation at cost of the UPC image reconstruction methods which is only available within SEPS. However, for scenes providing the largest differences the simulations will be repeated using SEPS, and thus the performance of the UPC image reconstruction method will be assessed for these specific cases, too, allowing a comparative assessment.

CCN SM Retrieval Study – OS Retrieval:

NR reported that the midterm meeting in November closed successful with a draft delivery of the retrieval software, which now includes salinity algorithms. The software is designed

modular to allow for testing of different models. First salinity estimations for different ocean regions have been presented as well as a comparison of derived brightness temperatures with the detailed instrument simulator SEPS developed by CASA. Results are consistent, however, some unexplained discrepancies remain in particular for temperatures over land.

OS Synergy Study:

HR reported that the second progress meeting took place in November at Ifremer in Paris. The objective was to discuss first results for the development of temperature and roughness correction schemes for salinity retrieval. For SST corrections the baseline will be the analysed SST product of the GODAE pilot project. The roughness correction scheme will rely on model winds from ECMWF and incorporate a blending scheme with scatterometer and potentially altimeter data. The midterm meeting is planned for end of January.

SM Synergy Study:

MB reported that proposals received in response of the ITT are under evaluation.

8. SMOS Science Report

MB reported on the status of the SMOS Science Report. It was agreed to aim at a publishing date in spring 2005 if possible together with the AO cal/val release. Various actions to complete the report were defined.

9. ELDAS Summary / Assimilation Soil Moisture

MDr and BvdH summarised the findings of the ELDAS project and outlined the requirements for future activities needed to prepare the modelling community for the SMOS data stream. Following detailed discussions the SAG recommended that the Agency *initiate a study to improve the assimilation of soil moisture fields/brightness temperature fields in NWP*s (R: 16.1).

10. Date & Place of Next Meeting

It was agreed to have the 17th SMOS SAG meeting at ESTEC on 5 and 6 April 2005 and to schedule the 18th meeting in the timeframe October/November 2005.

16th SMOS SAG Meeting**2/3 December 2004****ESA-ESRIN, Frascati, Italy****starting 2 December at 09:00, room Magellan****Agenda**

1. Welcome and Introduction – objectives of the meeting - approval of draft agenda
2. Actions from the last meeting
3. Project status (A. Hahne)
4. Status of the Level 1 and level 2 prototype processors (M. Zundo, S. Delwart)
5. Findings of the 5th Workshop
6. Studies & Campaigns:
 - CoSMOS status quo and next steps (P. Wursteisen)
 - SMEX'05 (T. Jackson)
 - Dome-C status quo (M. Drinkwater)
 - Overview and status of study activities (techn. officers / contractors)
7. Cal/Val:
 - On-board calibration issues/ G-matrix initialisation (A. Hahne)
 - Moon/sky measurements with Lewis (Y. Kerr)
8. SMOS Science Report
9. Assimilating soil moisture fields (M. Drusch)
10. AOB
 - GEWEX (P. v. Oevelen)
 - Time and space scales in AMSR-E SST fields (D. Stammer)
11. Date & Place of next meetings

Members of the SMOS Science Advisory Group

Name	Company/Department	Address	Phone	Fax	E-mail
Anterrieu, Eric Dr.	Observatoire Midi-Pyrénées, Laboratoire d'Astrophysique - UMR5572	14 av. Edouard Belin, 31400 Toulouse, France	(33) 5 6133 2881 (direct) or x2929	(33) 5 6133 2840	Eric.Anterrieu@ast.obs-mip.fr
Corbella, Ignasi Mr.	Polytechnic University of Catalonia (UPC), Signal Theory and Communications	Campus Nord, Edifici D3, C/Jordi Girona 1-3, 08034 Barcelona, Spain	(34) 93 401 7228	(34) 93 401 7232	corbella@isc.upc.es
Font, Jordi Dr.	Institut de Ciències del Mar CMIMA-CSIC, Physical Oceanography Group	Passeig Marítim de la Barceloneta, 37-49, 08003 Barcelona, Spain	(34) 93 230 95 12/00	(34) 93 230 95 55	jfont@icm.csic.es
Kerr, Yann Dr.	CESBIO	18 avenue Edouard Belin, 31401 Toulouse Cedex 9, France	(33) 5 61 558522	(33) 5 61 558500	Yann.Kerr@cesbio.cnes.fr
Le Traon, Pierre-Yves Dr.	Collecte Localisation Satellites (CLS), Space Oceanography Division	8-10 rue Hermes, Parc Technologique du Canal, 31526 Ramonville Saint-Agne, France	(33) 5 61 39 4758	(33) 5 61 39 3782	Pierre-Yves.Letraon@cls.fr
Mätzler, Christian Prof.	University of Bern, Institute of Applied Physics	Sidlerstrasse 5, 3012 Bern, Switzerland	(41) 31 631 8911	(41) 31 631 3765	matzler@iap.unibe.ch
Peichl, Markus Dr.	DLR, Institute of Radio Frequency Technology and Radar Systems	Oberpfaffenhofen, 82234 Wessling, Germany	(49) 8153 282390	(49) 8153 281135	markus.peichl@dlr.de
Reul, Nicolas Dr.	IFREMER, Département d'Océanographie Physique et Spatiale	Centre de Brest, BP 70, 29280 Plouzané, France	(33) 2 98 22 44 10	(33) 2 98 22 45 33	nreul@ifremer.fr
Skou, Niels Prof.	Technical University of Denmark, Department of Electromagnetic Systems	Bldg 348, 2800 Lyngby, Denmark	(45) 45 881444	(45) 45 931634	ns@oersted.dtu.dk
Stammer, Detlef Prof. Dr.	Universität Hamburg, Institut für Meereskunde, Zentrum für Meeres- und Klimaforschung	Bundesstr. 53, 20146 Hamburg, Germany	(49) 40 42838 5052	(49) 40 42838 7063	stammer@ifm.uni-hamburg.de

Name	Company/Department	Address	Phone	Fax	E-mail
Van de Griend, Adriaan Dr.	Vrije Universiteit Amsterdam, Department of Hydrology & Geo-Environmental Sciences	De Boelelaan 1085, 1081 HV Amsterdam, The Netherlands	(31) 20 4447331/4447303	(31) 20 4449940	Griend@geo.vu.nl
van den Hurk, Bart Dr.	Royal Netherlands Meteorological Institute (KNMI), Atmospheric Research	PO Box 201, Wilhelminalaan 10, 3730 AE de Bilt, The Netherlands	030-2206 338	030-2210 407	hurkvd@knmi.nl
Wagner, Wolfgang Prof.	Vienna University of Technology, Institute of Photogrammetry and Remote Sensing	Gusshausstraße 27-29, 1040 Vienna, Austria	(43) 1 58801 12225	(43) 1 58801 12299	ww@ipf.tuwien.ac.at
Waldteufel, Philippe Dr.	IPSL/Service d'Aéronomie du CNRS	B.P.3, 91371 Verrières le Buisson Cedex, France	(33) 1 6447 4320	(33) 1 6447 4348	philippe.waldteufel@aerov.jussieu.fr