

Minutes of the HMG-CSSI meeting, Lisbon, April 8, 2016

List of participants :

Lisa Bengtsson, Daan Degrauwe, Maria Derkova, Ryad El Khatib, Claude Fischer, Inger-Lise Frogner, Bent Hansen Sass, Jeanette Onvlee, Patricia Pottier, Roger Randriamampianina, Patrick Samuelsson, Daniel Santos, Piet Termonia, Alena Trojakova, Martina Tudor, Christoph Zingerle

Excused : *Yong Wang, Jean-François Mahfouf*

Remot participants (WebEx) : *Pierre B nard, Alex Deckmyn*

The CSSI chair (Claude Fischer, CF) accepts to act as chair for this meeting. He proposes the adoption of the agenda below and to focus on the issues for further coordination, as they might arise from the workshop week. In addition, Claude suggests to that potential topics for the strategy are listed in view of the meeting in Toulouse end of April.

No A.O.B. is proposed and the agenda is unanimously adopted.

Patricia is asked to prepare the minutes of the meeting and the 2016 ToDo list to be reviewed at the end of this meeting.

1 Review of actions agreed on in the Copenhagen HMG-CSSI meeting

1.5 Overview of IFS/Arp ge cycles, key aspects (oopsification), preparation of CY43T1

2 Ongoing/planned activities, possibly including the identification of specific topics to be taken on board of the strategy meeting

2a. Model physics and dynamics

- i. ESCAPE
- ii. Definition of the CMCs
- iii. LBCs: status (after the Brussels meeting last year)
- iv. radiation/cloud/microphysics/aerosol interactions and the way our models handle them.
- v. ECOCLIMAP and high-resolution physiographic data; sub-km experiments

2b. Verification and validation

- i. follow up on HARP
- ii other verification/validation activities (testbed, Cloudnet, re-analysis and climate-mode validation, LES, ...)

2c. Predictability

- i. identification of common research questions

2d. Data Assimilation

- i. OOPS: status and LAM specific needs (e.g. DFI)
- ii. COPE
- iii. algorithmic developments: identification of common research questions
- iv. surface data assimilation, also in relation to Surfex-v8
- v. status on OPERA
- vi. new types of observations (action planned last year)

2e. System aspects

- i. follow up of the Bratislava System WW
- ii. scalability and optimization aspects

3 HMG/CSSI wrap-up discussion of item 2 for the strategy workshop in Toulouse: topics of interest, information useful for Tlse, points of attention

4 External collaboration issues

- i. ESCAPE WP4: management issues
- ii. SRWNP-EPS

5 AOB

6 List of actions taken during the meeting => 2016 ToDo list

1. Review of actions agreed on in the Copenhagen HMG-CSSI meeting

Patricia has prepared a googledocs where former/new HMG and CSSI members have filled the status of the 2015 actions. This file is shared by all HMG & CSSI members who can fill it over the year. The status of the actions is discussed.

Planned in April 2015		Status in April 2016
Who	Action	
Verification and validation		
Piet, Maria Monteiro	Organise forecaster meeting mid-October 2015 : Can the forecaster make something out of convection permitting EPS ? Disseminate minutes of last year meeting	Done. Action closed.
Xiaohua, Alex, Christoph	HARP: version 2 for next year with spatial and conditional aspects (neighbourhood, radar data, ...). See plans after last March Brussels WW and confirm manpower.	Not much progress on v2 of HARP - due to lack of manpower. Some basic work has been completed, mainly dealing with data handling of radar data and INCA analysis. First version of the spatial verification tool is installed in Austria and Portugal. New ideas and plans were discussed in De Bilt in March 2016 and in the Working Group during the Lisbon Wk. Action closed for HARP v2. Work will continue for HARP v3.
Lisa, Swim, Eric	KNMI testbed : complete and send minutes of the Elsinore clouds WG asap; Technical work still needed for the testbed (manpower issue): postprocessing tool and driving model HARMONIE instead of RACMO.	A "common MUSC cycle 38 code" between MF and HARMONIE has been generated by Eric Bazile and Wim de Rooy. This code reproduces results from AROME Meteo-France in the HARMONIE system given the same namelist and ARPEGE driver files. The code has been exported to Lisa Bengtsson and Yann Seity, additional physics has been added (OCND2, ICE3 time-step independence, LCRIT...) and the testbed can now be used externalized (working e.g. at SMHI and validated against CLOUDNET observations). Action done.
Predictability		
Piet	Continue contacts between ALADIN & HIRLAM people (Alex, Theresa/Martin, Inger-Lise, François B...). Put emphasis on contact with MF. Piet will propose a doodle for a web-conference before summer. Note: webex should focus on scientific exchange for convection-permitting EPS	Commucation was done, without doodle. Action closed.
Data Assimilation and Observations		
Alena, Jean-François, Ulf, Eoin	read/react on the COPE3 document : Jean-François will organise (before the end of May) a web-conference to prepare ECMWF kick-off meeting of COPE3 (feedback from ALADIN-HIRLAM partners)	The COPE board meeting was organized by ECMWF on 17 July 2015 to close COPE2 and start COPE3 (Jean-François attended). A COPE3 visio-conference was organized by ECMWF on 9 October 2015 (Jean-François could not attend but ALADIN and HIRLAM partners were invited). A recent COPE board meeting took place on 21 March 2016 (ECMWF staff + Jean-François). Discussions took place beginning of April during hangout meeting

		organised by Roger. There are more detail plans on ECMWF wiki page. JFM will organise more discussions. Action closed at HMG/CSSI level.
Jean-François, Eric Wattrelot, Martin Ridal, Alena, ACNA	OPERA inquiry : continue updating the wiki-page (additional countries welcome to put their information on this page) and understand the obs we want to have with what sort of quality flags. Send regular information to JFM+Martin, and JFM+Martin to send our information to other SRNWP representatives in the OPERA user group.	Recent participation of Eric Wattrelot to the OPERA meeting (March 2016) to stress again the needs of the SRNWP community on specific quality flags for the assimilation. Action done , general coordination efforts NWP/OPERA to be continued.
Jean-François, Claude, Jelena	Exchange experiences about new types of observations, design aspects, the trend from interpolation to integration for obs operators for very high resolution assimilation => item to be put on the agenda of the 2016 HMG/CSSI.	Few work on this action in 2015 : total slant delay for GPS is under development in HIRLAM (Siebren de Haan); exchanges between Eric Wattrelot and HIRLAM on the evolution of BATOR at Météo-France to accomodate the ODIM HDF5 radar format of OPERA. To be kept in the list of actions for 2016.
Jelena	organise a video-conf to address the pbs noted in 4D-Var implementation : prepare a summary of the questions/issues first	Document prepared. Done. Action closed.
Jelena,	set up a wiki page to share information on surface DA (like it was within the former SRNWP Expert Team); Jelena and JFM to contact relevant people for uploading scientific info	HIRLAM WW on surface data assimilation, April 2016 in Oslo: the wiki will be complemented with relevant satellite information. Work concerns products and direct irradiances from MERIS/SMOS, AMSR2/GCOM-W1, SAR-C/Sentinel-1. E.g. Snow Water Eq. and soil moisture. Intended DA framework is EnKF. Action closed . Patrick will take care of the communication.
Claude	confirm dates for the obs operator OOPS WS + possibly additional day for design aspects with ECMWF (30 June)	These meetings took place in Toulouse on 30 June - 3 July 2015. Participants from ECMWF (YT, AG, PL) , Hirlam (JB, RS, EW) and GMAP (OBS team and DA algorithm staff). Action closed.
System		
Ulf	Ulf will create a VAR-toy for technical pre-validation of components of the assimilation.	Not done . It's a complex issue but these tools are quite important. Ryad suggests that one should look at the ARPEGE 4Dvar-toy as a starting point. Expertise is an issue and maintenance too. OOPS should provide some tests.
Claude, Ulf	before summer : choose a date and organise a webex to discuss the content of CY42T1 between HIRLAM/MF	Action closed . CY42T1 eventually was cancelled (straight update CY42 => CY43 was decided with ECMWF). A technical video-conference was done on 17 March 2016 for discussing content of CY43T1. A number of actions have been decided for preparing the code commitments (Claude, Daniel, Ulf, Daan, Ryad, Alexandre).
Ulf, Piet, Mariska	arrange a system WW (in autumn): reproduce the validation of ALARO-1/cy40t1 in the Harmonie system context (with ISBA, to be discussed for SURFEX) ; think about how to arrange more common validation for CY42T1	Done . Read more on Hirlam wiki .

Dynamics		
Piet	organise WW in Brussels after PAC about weak-constraint boundary conditions (Mariano, Marko, Fabrice, ...)	WW was organized but the implementation is an issue. Action done.
Claude, Piet	ensure exchange of scientific results and experimental settings on cubic grid testing. Light action: organise a web-conference with Pierrot + Ludovic + people in Brussels (during WW above)	Action closed. But there is still an action with Alvaro Subias, Mariano Hortal and Karim Yessad for agreeing on code design choices for the cubic grid options tested in Harmonie (CY43T1).
Physics		
Daan	Common interface for turbulence : Daan acts as project leader and contacts Laura or others if necessary, for discussing design or testing aspects	Action ongoing. First feasibility analysis was done but the coding did not start yet. (with new MoU, CMCs, Code Architect position, ...) . This activity is going to be resumed after selection of the Code Architect.
Bent, François By, Laura & Claude	set up a WG for aerosol modelling adaptation : Bent should precise the longer term scope of the WG and detail/split the NWP and the external aspects (interaction radiation/aerosol/clouds, initialisation of aerosols <i>versus</i> atm chemistry, coupled modelling, ..). Should be submitted to HAC/PAC, depending on the proposed scope.	Some e-mail communications took place during summer and autumn, regarding planning of aerosols in Arome/Harmonie/Aladin. At this stage two documents are available with ideas on how to proceed, mainly worked out by François and Bent. Action closed.
Piet, Ulf	Keep each other informed of the actions around surface fields interpolation (Surfex related): to study the issue of coupling ALADIN-ISBA to ARPEGE-Surfex (Aladin priority) and/or the optimization of PREP (Hirlam priority: for 4D-VAR).	Done. cf discussions at the LTM meeting where Daniel was invited as observer.
A.O.B.		
ALL	keep Patricia informed on the ALADIN or HIRLAM WW (dates, location, ...).	Done. See "Events to come" on main page: www.cnrm.meteo.fr/aladin/ and the list of the WWs with direct links to the relevant pages on ALADIN or HIRLAM webpages.
Jelena	pass information on a new funding action in preparation, for submission, on predictability	The TIP-POP proposal (H2020, FTOPEN) was rejected and is to be re-submitted in January 2017. Action closed.
Jeanette, Piet	consider new call for H2020 space programme (in link with development of COPERNICUS services)	Action closed.

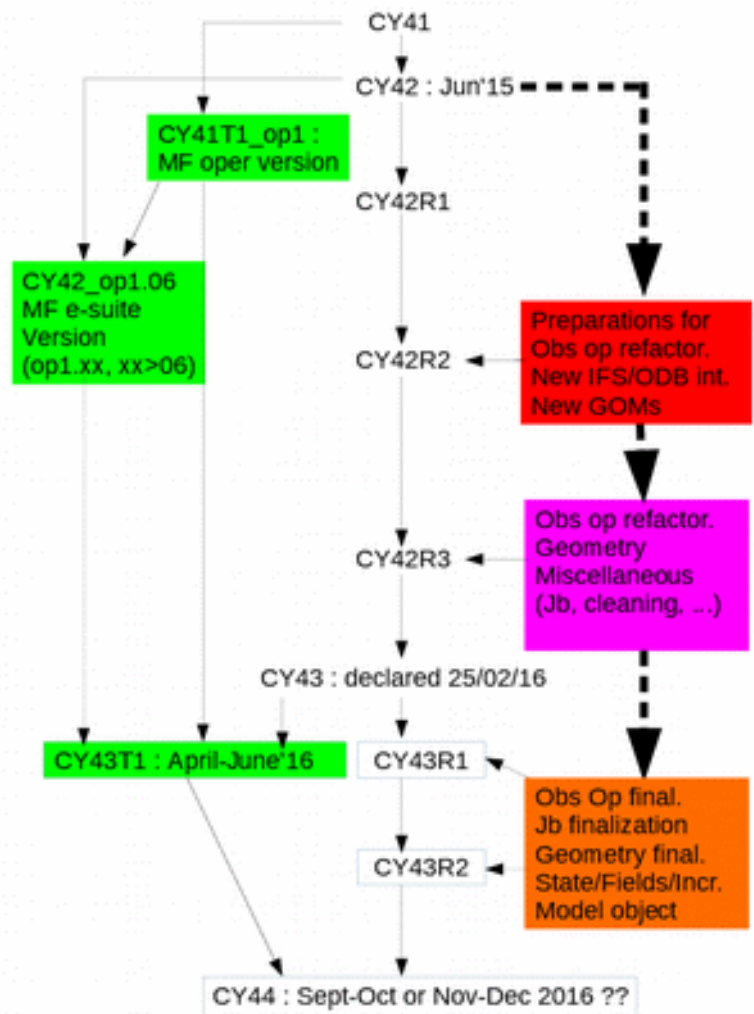
1.5 Overview of IFS/Arpège cycles, key aspects (oopsification), preparation of CY43T1

Due to lack of time, this point is not fully discussed : a preparatory document has been sent; the timing of the cycles and e-suites together with some important milestones are summarized in the graphic below.

Main points discussed during this short discussion :

- Quite usually, operational versions at Météo-France are based on cycles that are 2 cycles behind research-cycles.

- The SURFEX team works with a number of partners, in a sequential mode and won't enter our NWP cycling procedures => this is not an issue : Patrick is aware of the new version of SURFEX (as member of the SURFEX SC). For CY43T1 SURFEX V8 will implemented plus a few additional contributions for NWP. These additional contributions will also have to be committed later to the official SURFEX trunk (so that will eventually will be re-imported in the NWP libraries with a future SURFEX import)..
- It is agreed that Daniel will communicate to Claude the list of actions/contacts when preparing the HIRLAM proposed contributions to the next cycle T. These actions actually already started in mid-March.



2. Ongoing/planned activities, possibly including the identification of specific topics to be taken on board of the strategy meeting

These discussions are mainly summarized in the “2016 list of actions” (see point 6), only complementary remarks to the list of actions are reported below.

2a. Model physics and dynamics

i. ESCAPE

ALADIN/HIRLAM are involved in ESCAPE (i.e. Bent is involved in ESCAPE WP1 with ACRANE2). LAM activities in ESCAPE WP4 are led by Piet.

Lisa explains that Marko will continue to work with Fabrice, Daan and Piet on the weak-constraint approach. Mariano has retired but HIRLAM has new available manpower and would like to define a framework to work together with ALADIN and to collaborate with MF on the scalability.

Claude underlines the importance that the MF/ALADIN/HIRLAM community sets clear plans where the common approaches with ECMWF are visible (VFE-NH for global) but also where possible alternative solutions of future dynamical core options (eg. MPDATA v/s a SISL-based core) can be studied and discussed with ECMWF

Pierre proposes ideas to work on toy models with newcomers from HIRLAM (AEMET, Met-Eireann, SMHI staff); visits to Toulouse probably can be envisaged.

See Action **A13**.

ii. Definition of the CMCs

Piet explains that with the 5th ALADIN MoU, the work on the definition of the ALADIN CMCs is going to be resumed after selection of the Code Architect (ToR and funding of the CA are secured, the selection is on-going).

The CA will assist the PM to define and supervise the ALADIN system; his work will be reported to PAC and GA.

Jeanette adds that HIRLAM will have a CA on DA (the ToR and the selection have still to be discussed).

So far, 2 CMCs exist in ALADIN : ALARO and AROME. A scientific paper should be published on ALADIN. An ALADIN CMC is a configuration of the code (set of options and namelists), documented, validated and maintained, under the responsibility of the ALADIN Consortium.

Jeanette proposes HARMONIE as a 3rd CMC and announces that HIRLAM is also preparing a paper to describe HARMONIE, showing what HIRLAM added to the ALADIN base system.

Lisa asks if it would be possible to combine options and run combinations of possibilities.

Claude answers that it would be possible to test different combinations but we can only dedicate manpower to the validation of the CMCs, not for all possible combinations.

iii. LBCs: status (after the Brussels meeting last year)

iv. radiation/cloud/microphysics/aerosol interactions and the way our models handle them

Bent explains that the main complications preventing the implementation of more complex aerosol treatments as further extension to the Arome/Harmonie/Aladin high resolution NWP framework is the lack of a finalized physics/dynamics framework. This is under development, but it may be difficult to finalize until 2017-18 when OOPS related changes in IFS are sufficiently mature. Furthermore, developments on scalability in external projects such as ESCAPE, e.g. multigrid options, will likely be extremely valuable when implementing and running expensive aerosol schemes. It seems necessary to start discussing these strategic coding issues now.

Piet would like to make sure that all interested people can be involved in the discussion and agree on the scientific scope and on the consequences on the code. See Action [A14](#).

v. ECOCLIMAP and high-resolution physiographic data; sub-km experiments

Patrick explains that there are alternative high-resolution physiographic data to ECOCLIMAP and that SURFEX will use as input data closer to the satellite data.

2b. Verification and validation

i. follow up on HARP

See Action [A1](#).

ii. other verification/validation activities (testbed, Cloudnet, re-analysis and climate-mode validation, LES, ...)

KNMI testbed : Lise explains that the tests with ALARO physics, and more generally the possibility to have all the physics in a same framework should be developed in CY43T1. The testbed ideally should work both in H and T environment and but how to maintain it remains open. The scientists involved in the cloud/turbulence/microphysics group have started to work on an update of the single-column model (MUSC). This technical work is done in CY38 but it is intended to port it on top of CY43T1. This work is led by Lisa and Eric Bazile. See Action [A2](#).

The climate-mode validation was addressed. It will develop in future, though the exact link with the NWP validations remains open (different errors, different timetables of validation).

Christoph raises issues about verification of clouds: it has been discussed lately (cf. WMO working group), methods still have to be defined. This is proposed for a special topic or a working group during next year joint Wk/ASM (April 2017, Helsinki). See Action [A3](#).

2c. Predictability

i. identification of common research questions

High resolution (convective) EPS is now an active area of R&D : SRNWP-EPS started in 2015 and is a good opportunity to strengthen our cooperation even if it is a EUMETNET project, thus based on the countries, not on the consortia. See Action [A4](#).

For non convective EPS, there is cooperation within the GLAMEPS and LAEF projects. A more global cooperation on EPS, at the level of both consortia, remains a fairly open topic as there is a tendency for the groups to organise the EPS work rather in sub-groups. Piet expresses his opinion that EPS mostly could become an optional activity at ALADIN/HIRLAM level. This will be discussed during the strategy workshop in Toulouse.

2d. Data assimilation

i. OOPS: status and LAM specific needs (e.g. DFI)

On the OOPS board meeting in January, people at ECWMF were satisfied by the progress and the implication of MF and other LAM partners. The re-factoring of Fortran is the main issue and has already taken more time than expected. There is pressure on ECMWF teams to give demonstration prototype of 4D-var with OOPS.

Daniel will attend the next technical video-conference with ECMWF.

An OOPS wrap-up discussion will be put on the agenda of the 2017 HMG/CSSI meeting. See Action [A9](#).

ECMWF has requested Roel Stappers (from HIRLAM) and Etienne Arbogast (from MF) to visit Yannick. The purpose and the outcomes of these visits should be shared (Claude is the contact point).

ii. COPE

Claude explains that after the reorganisation of the COPE project at ECMWF, there are some changes in technical specifications. Technical meetings are/will be organised. Roger confirms that Météo-France, ALADIN/HIRLAM, and ECMWF are in touch on this topic through the video-meetings he organises. Thus, the action is closed on HMG/CSSI side and becomes an action for the hangout video-meetings.

iii. algorithmic developments: identification of common research questions

Roger refers to his presentation at the workshop where he presented the DA schemes in HARMONIE and schemes that HIRLAM would like to build together with ALADIN : how to build some schemes (EnVar) should be regularly discussed, in order not to diverge. Roger suggests that two solutions, if agreed, are not obligatory a problem and could made our system better.

Claude stresses that, given the heavy workload for refactoring the IFS, OOPS would not provide an “ideal” framework for DA testbeds, at least not soon.

iv. surface data assimilation, also in relation to Surfex-v8

A Side-meeting was dedicated to surface data assimilation during the joint Wk/ASM. Another Wk will take place in Oslo next week. Patrick will lead the SRNWP surface expert team and take care of the communication within ALADIN/HIRLAM (hangout meetings). See Action [A7](#).

Patrick reports on the last SURFEX SC : the SURFEX team would like to stop supporting any surface code (i.e. OI_main) besides SODA (SODA will be updated to CY43T along with SURFEX V8).

See Action **A8**.

- v. status on OPERA

There is on-going communication within ALADIN/HIRLAM/MF and the OPERA team (Eric W. at OPERA user group meetings, ...). The consortia need to continue to exchange and collaborate in order to pass a common and clear message to the OPERA core team about the specifications for NWP (raw data + filtered 3D data, quality control flags). It is important to make OPERA aware of the problems we face and to maintain the pressure on the OPERA team to take into account NWP needs .See Action **A5**.

- vi. new types of observations (action planned last year)

This action is kept for 2016 : exchanges should be intensified with video-meetings. See Action **A6**.

See also Action **A10** and Action **A11**.

2e. System aspects

- i. follow up of the Bratislava System WW

The system WW took place and minutes were issued. The common validation of the next cycles is very open. It is proposed to discuss the content of the next system WW before the summer and to plan the WW in autumn. Piet proposes to have the first discussions within an ACNA WebEx meeting. A specific matter is the difficult process of validation of DA configurations in partner countries, especially in ALADIN. Piet considers this as a priority problem to tackle in ALADIN (how to enable all partners to run DA, how to help them validate it). Roger agrees that this topic can become an area of more collaboration between ALADIN and HIRLAM. Mariska will compile a draft list of technical problems encountered by the ALADIN Partners with CY40 (what kind of problems with what sort of data). See Action **A12**.

- ii. scalability and optimization aspects

Ryad reports on the continued activities in GMAP on these topics :

- New optimisation for ARPEGE/AROME physics was done in CY42 (see Ryad's presentation at last year Wk); it can be extended to other physics and can be applied on other parts of the code; Bent asks if the vendors are of any help (pointing problems, giving solutions). Ryad confirms that they may point the problems but leave it to us to find and provide the algorithmic solution. Daniel comments that he hopes that the Barcelona HPC center will go further than just pointing out problems.
- Philippe did some years ago some tests of scalability of AROME (800 nodes) ; since then, computers have improved and we should re-do the tests. The vendors generally agree to let us use their computers but the main concern is the manpower dedicated to scalability (money to fund this manpower and difficulty to find people with the knowledge of different models to run comparison tests). First step would be to prepare an overview of where the codes have been ported and tested.

3. HMG/CSSI wrap-up discussion of item 2 for the strategy workshop in Toulouse: topics of interest, information useful for Tlse, points of attention

The HMG/CSSI reviews the points already raised and considered as the most important to be discussed during the strategy meeting.

Lisa raises the question of the branding of the future single consortium : this point will be tackled at the directors' level, not during the strategy meeting.

Jeanette asks the HIRLAM participants to prepare a brief presentation, to focus mostly on the core issues and on how to organise the work.

Piet underlines the importance of moving forward in DA in a very concrete way, by helping the countries that still have no data assimilation to get started with by identifying and providing a basic configuration. Roger agrees on the importance of this concrete approach and is willing to contribute. Piet insists on the necessity to make this topic visible in the strategy.

Below are the points proposed by the HMG/CSSI :

- Definition of core (common to everybody) versus optional activities (LACE, HIRLAM, MF, ...)
- Surface DA
- OOPS and link with LAM needs
- Validation tool for data assimilation components (cf mitraille for forecast model)
- common validation and common maintenance of all the system (including use of CMCs)
- Dynamics: position towards PantaRhei => A-H-MF collaboration to investigate alternative solutions with respect to ECMWF choices
- clouds/radiation/microphysics/aerosols interactions (toward two-moments schemes ?)
- DA : Identification of common research in algorithmic developments ; configuration for nowcasting
- How to get started with DA at home for the different partners ?

4. External collaboration issues

ii. ESCAPE WP4: management issues

ii. SRWNP-EPS

See Action **A4**.

5. A.O.B.

None.

6. List of actions taken during the meeting => 2016 ToDo list

The table below is presented and accepted by HMG/CSSI as the list of actions for 2016, to be reviewed at the next HMG/CSSI meeting.

2016 Action list (as planned in April 2016)	
Who	Action
Verification and validation	
A1 : Bent, Alex, Christoph, Inger-Lise	HARP: version 3 with spatial and conditional aspects. (neighbourhood, radar data, ...). Manpower agreed on and planned regular WebEx meetings. Doodle to find a date for next week.
A2 : Lisa & Eric (MUSC) and Daan, Daniel & Claude	KNMI testbed : to figure out a way how to maintain the MUSC system both in H and T environments
A3 : Christoph, Lisa	methods for validation of clouds : either in Special topic for next year Wk or discussed during a 2nd cloud working group meeting

Predictability	
A4: Inger-Lise, Alex	Reporting of the start of SRNWP-EPS project and coordinating with consortium work (physics and surface people)
Data Assimilation and Observations	
A5: Roger, Eric W., Jean-François	OPERA meetings : maintain the pressure on the OPERA team to take NWP needs into account (QC flags, 3D raw data, ...)
A6: Jean-François, Claude, Roger	"Exchange experiences about new types of observations, design aspects, the trend from interpolation to integration for obs operators for very high resolution assimilation => item to be put on the agenda of the 2017 HMG/CSSI."
A7: Patrick, Eric B.	Communicate and share information on surface DA (hangout meetings), possibly in SRNWP framework (possible web page on EUMETNET ?)
A8: Patrick, Rafiq, Yves	SURFEX V8 : report on the evolution of SURFEX (SODA) and assess the impact on ALADIN/HIRLAM (SODA versus OI_main), help evaluate consequences
A9: Claude, Jeanette, Roger	OOPS wrap-up discussion (status and any coordination matter) in 2017 HMG/CSSI meeting
A10: Claude	MF MODE-S information : to be passed to Jeanette
A11: Jean-François, Claude, Roger	Ensure communication about slant delayed GPS
System	
A12: Mariska, Daniel, Piet, Claude	ACNA will compile a list of problems encountered by the ALADIN Partners with CY40 (with some focus on DA components) with what kind of data, in which format. To be discussed with Roger (hangout meeting), then during ACNA WebEx (included Daniel).
Dynamics	
A13: Piet, Pierre, Lisa	Start new cooperation with new available manpower in HIRLAM (3 people), ALADIN and MF. Some training + studies with toy models is offered by Pierre. Next steps are depending on Toulouse Strategy meeting discussions and outcomes.
A14: Piet, Jeanette	Licence issue : establish a comprehensive list of partners that have the code
Physics	
A15: Daan, Lisa, Bent	To be discussed in the ALARO WD in Brussels: what is required in microphysics schemes to accommodate aerosols (eg. 2-moment schemes ?).
A.O.B.	

7. Closing

The meeting is closed (at 18:15). The next meeting will be held in Helsinki on April 7, 2017.