

SURFEX Steering committee
4th meeting: 19 March 2014
Toulouse/Brussels

Participants:

ALADIN: Rafiq Hamdi, Piet Termonia (ALADIN Program Manager)*
HIRLAM: Ekaterina Kourzeneva
Meso-NH: Jean-Pierre Chaboureau
GMGEC: Bertrand Decharme
GMAP: Jean-François Mahfouf
GMME: Aaron Boone
SURFEX team: Patrick Le Moigne*, Eric Martin

(* = expert)

Summary written by Eric Martin

Meeting agenda:

1. Discussion on transversal subjects :
 - a. Further work on code optimisation (PGD/PREP)
 - b. File format FA
 - c. Surface assimilation (SODA)
 - d. Physiography/topography
 - e. Teaching
2. Review of activities and plans
3. Final discussion, conclusions, next meeting

Meeting summary:

Note that preparatory documents and presentations are available on SSC web page :
<http://www.cnrm.meteo.fr/surfex-lab/spip.php?article55>

1. Discussion on transversal subjects

a. Further work on code optimisation (PGD/PREP)

Piet Termonia introduces the discussion and points the need to have efficient and robust PGD and PREP programs for the many LAM applications in ALADIN and HIRLAM countries. The work did last year on PGD/PREP was successful, but is not enough to cover the need of all present and future applications. Another issue is the need to increase the competence of the consortia in SURFEX, in order to be more reactive in case of operational problem or new developments.

Technical solutions were briefly discussed. Coupling PREP with FULPOSS, or parallelising PREP are two options to evaluate. Jean-Pierre Chaboureau mention that the PREP phase is parallelised in MesoNH, but need further improvements. Eric Martin recalls that an autonomous efficient PREP is needed, for the offline users. The evaluation of the parallelisation of PGD/PREP is on the agenda of Stéphanie Faroux for the second part of 2014 (in the absence of Stéphanie Faroux, this point could not be further discussed). It is also recognised that this important subject should not rely only on one person. Piet Termonia says that there is a possibility to allocate some manpower on this subject in 2015, but the condition is that the importance of this work should be recognized in order to be able to allocate the manpower. Currently there is no concrete documented proposal (involving strategic choices, calendar details and man power estimates). Piet Termonia proposed to formulate one and discuss it during the next SURFEX SC to form the basis for a long-term approach. This will be reported to the ALADIN General Assembly.

In conclusion, the SSC highlights the importance on further work on PGD/PREP parallelisation and robustness. The short terms plans are an analysis work led by Stéphanie Faroux, but additional manpower is needed and the proposal of Piet Termonia is a good opportunity to continue this work and support this initiative. The work should involved (at least for expertise) Stéphanie Faroux, Ryad El Khatib, Daan Degrauwe, Tayfun Daykiliç, Trygve Aspelien, one expert from the climate group.

b. File format FA

Due to different constraints and history in the implementation of the FA files in the NWP and climate groups of MF, there are two ways to handle this file format in SURFEX in coupled mode (MSE, the interface code between SURFEX and the atmospheric model is also concerned). This situation is confusing for teams outside MF and may cause maintenance problems in the future. The full use of FA will be available in V8 (at least for FLAKE and ISBA) thanks to the climate group that coded the reading of FA in PREP.

Jean-François Mahfouf and Bertrand Decharme agree to evaluate the present situation, the different constraints and propose a solution to converge on a unique FA implementation.

c. Surface assimilation

Jean-François Mahfouf introduces the point and summarizes his preparatory document. During the recent month, an incompatibility between the Canari/OI_main implementation in MF and SODA appeared and was solved by Philippe Marguinaud and Trygve Aspelien. MF plans are to continue the use of OI_main as it is very efficient in operational mode. Alina Barbu had some difficulties to move from VARASSIM to SODA for the assimilation of surface variables. Due to lack of manpower, and to anticipate the departure of Alina Barbu, it has been decided to include VARASSIM in the v8. However Eric Martin mentions that this option may cause conflicts and maintenance issues in the future. Today SODA, OI_main and VARASSIM co-exist in the SURFEX repository. HIRLAM (see also preparatory document) plans to continue the development of SODA in the future and to improve its efficiency to meet the operational needs and to assimilate new variables in the future.

In conclusion, it is recognized that SODA is still a new code and will be improved in the future. The present situation is partly caused by a lack of manpower. It appears that the OI_main offline implementation is no more used and can be removed (after a final verification that it is the case!). The SSC supports the project of the development of common and efficient assimilation codes. This subject will be further discussed during the next ALADIN workshop/ HIRLAM all staff meeting (7-11 april) during a discussion session on assimilation for NWP in the presence of some members of the SSC.

d. Physiography/topography

Ekaterina Kourzeneva introduces this point (see also the preparatory documents). There is an increasing need for high resolution database for orography and physiography for research and operations. In the 2013 EWGLAM meeting, a general feeling was expressed that the issue of geospatial data could be an interesting topic for further cooperation. Jeanette Onvlee, Laura Rontu, and Ekatarina Kourzeneva prepared a draft questionnaire to assess the interest of SRNWP countries in this action. The participants think that this initiative is interesting and suggest to simplify the questionnaire (a part of the answers are the same for all countries within a consortium). Jean-Christophe Calvet is conducting an internal MF consultation in april with regards to new needs for ECOCLIMAP. The results of the consultation will be shared with the SSC. Another subject discussed is the displacement for water bodies in ECOCLIMAP 2. This situation should be corrected as soon as possible. This point will be submitted to Stéphanie Faroux when she come back (in may).

In conclusion, the SSC support the HIRLAM initiative and suggest to simplify some parts of the questionnaire, to take into account the fact that some answers are shared within the consortia. The ECOCLIMAP 2 issue will be submitted to Stéphanie Faroux

e. Teaching

In 2013, the Toulouse course (in French, 1-4 oct.), was full and gathered 20 people, The first "Nordic" course was held in Norrköping (25-28 Nov.) and was successful. 30 people attended the full course (the maximum limit) and 10 people attended lectures only.

After discussion, it has been decided to propose the Toulouse course in English in 2014. Another "Nordic" course will be organized, but not in 2014. A solution should be found to increase the capacity of the Toulouse course (more PCs, organize 2 courses, ...) if needed.

2) Review of activities and plans (see complete presentations in surfex-lab)

Surfex team :

- The V8 of SURFEX is built step by step, each contributor phasing its own code on the development branch. In addition, a new automatic test database is used to check side effects and reproductibility issues. Today, the V8 in development corresponds to the code entered in CY40t1. Additional scientific contributions will be entered, and the contribution from the climate group will be entered at the end. Then technical modifications, including the removing of global variables will be entered. The V8 will be only available without global variables.
- Plans are to move from svn to GIT, the date of this change is not yet fixed and will depend on the V8.
- The SURFEX V8 will be open-source. This needs some small adjustments in the distribution.
- The work on PGD/PREP will begin during the 2nd half of 2014.

ALADIN

- A paper, based on the work during the past ALADIN-ALARO-SURFEX weeks has been published in the GMD special issue SURFEX. Further tests were conducted with SURFEX V7.2 / CY38t1. A solution to run the pTKE scheme within ALARO has been found and will be available in V8.
- Small oscillations were detected during the EKF data assimilation. It was shown that they have a substantial impact on the performance of the EKF. The problem is under investigation. Some concrete proposals for solutions are currently known.
- The plans for the future are : solving the oscillation problem, coupling between the new turbulent scheme of ALARO named TOUCANS and SURFEX, introducing the STAEKF within the SODA platform.

HIRLAM

- A cold bias is observed in night winter time conditions in operational HARMONIE (CY37-38)
- SODA has been improved and a huge reduction of running time for large domains was observed. Work on data assimilation focused on new methods and data (ASCAT/SMOS) and the use of MESCOAN (EURO4M project)
- Snow/Ice : CROCUS is used in Norway and Iceland, MEB is tested over Europe. Several works are planned for snow assimilation, with a possible support from the new Snow COST Action. The development of a simple sea-ice model for NWP is in progress
- Lakes : testing of Flake in HARMONIE, inclusion in SURFEX of an improved version of the lake climatology and lake database are planned. DA assimilation in progress
- TEB : an intercomparison of different urban models is conducted
- Physiography : ECOCLIMAP, Corine, soil texture databases were studied into details, showing some discrepancies.

MESO-NH

- The version 5 of the model is being built using SURFEX V7.3. The main change in this version is a new advection scheme, that allows a significant improvement in computer time. This version will be open source.
- The V8 of SURFEX will be tested as soon as it is available

GMGEC

- The V8 is under construction and several improvements in ISBA, Flake are introduced. The direct coupling between SURFEX and TRIP is now replaced by a coupling with OASIS3-MCT. The sea-ice model GELATO is currently under tests.
- The plans are to continue the tests, phase the code in the official V8_dev code. Several developments on land-use, vegetation dynamics, vegetation parameters, soil heterogeneities will be introduced later.

GMME

- ISBA : the MEB is in progress. ISBA-DF is currently tested and a version will be passed to operational services for the hydrological chain. A new vegetation transfer model has been

implemented (v7.3). Several new features were included in the ISBA/TOP coupling. ISBA was run using the EURO4M atmospheric analysis.

- TEB : Several improvements in the current TEB version will be introduced in V8 (solar panel, ISBA-DF, soil under buildings)
- Flake : separation of rivers and lakes in ECOCLIMAP, model changes to allow consistency with other SURFEX schemes
- ECOCLIMAP : ECOCLIMAP albedos were updated using a 10 year time series of MODIS data.

GMAP

- CY40t1 under final validation (includes v7.3+HIRLAM and GMAP contributions that will be reported in V8). V8 will be included either in CY41t1 (end 2014) or in CY42T1 (end 2015), but the latter option may be problematic as important OOPS contributions are foreseen
- Ongoing activities : Now GMTED is used in ALADIN OM and in the future 1.3km AROME. AROME scores are degraded with ECOCLIMAP 2, but improved with SURFEXv7.3 (TEB). Output files in FA will be improved (compaction, removing of useless fields) for the next operational version (HR suite, 2015). The future ARPEG/SURFEX e-suite (end 2015) is under preparation. Some bugs in ECOCLIMAP1 (spurious lakes) and missing textural information for some island in HWSO were found.
- Needs
 - Maintenance of all the operational databases (SURFEX team)
 - Print of SURFEX OPTIONS in the listing (to be included by SURFEX team in V8)
 - Conversion tool from SURFEX to the old ISBA fields (the tool developed by GMGEC for ALADIN/climate could be checked)
 - PREP compatible with FA (see 1.b)
 - More efficient PREP version (see 1.a)

3. Final discussion, conclusion, next meeting

Important developments on lakes are undertaken in HIRLAM and GMME. Ekaterina Kourzeneva and Patrick Le Moigne will check the compatibility of this developments in order to avoid duplications and keep the coherence of the code.

Concerning the plans after the V8, the SSC agrees that a cleaning of the code and technical improvements should be privileged, before adding new scientific code into SURFEX

A SSC meeting might be needed to review plans for PGD/PREP during the autumn (before the ALADIN general assembly). If not, the next SSC meeting will be held within one year.