SSC4 SURFEX-team report
March 2013

1. Correspondence with atmospheric cycles :

SFX	Release of SFX version	NWP	MNH	CNRM-CM
V1	2005			
V4.8	2008	CY35t2	V4.8	
V5.8		CY36t1		CM5 (CY32+V5.8)
V6	2010	CY37t1*		
V7.1	2011		V4.9	
V7.2	Feb 2012	CY38t1		
V7.2.1	Jan. 2013	CY39t1		
V7.3	Feb. 2013		V4.10	CM6
		CY40t1**	V5	(CY37t2+V7.3)**
V8	Autumn 2014			

*v6+
**CY40t1 and CNRM-CM6 contain additional developments

2. Status of the preparation of the V8
More details are available here : http://www.cnrm.meteo.fr/surfex-lab/spip.php?rubrique125

Context :
The V8 of SURFEX will contain a large number of technical and scientific development. Based on the experience of the last version (7.3), a new organization has been set up. The building of this version is sequential, involving the developers one at a time, and an automatic test procedure has been set up in order to avoid side effects and limit debugging at the very end of the process, when coupled tests are done. From a technical point of view, the major change will be the removing of the global variables in the code. This operation will be done at the very end of the process. The V8 will be available only in its version without global variables (the intermediate version(s) without global variables will not be maintained). The V8 is partly built during the absence of Stéphanie Faroux (Decembre 2013 – May 2014).

Summary of contributions and contributors :
See the surfex-lab site. http://www.cnrm.meteo.fr/surfex-lab/spip.php?rubrique125

Status and plans :
The V8 in development contains :
- The branch « NEW_PREP » that contains many technical improvements, including the development proposed by ALADIN.
- The HIRLAM contribution (SODA+ other changes) (NEW_PREP_HIRLAM)
- The GMAP contribution to CY40t1 (perturbations of initial state + other changes) (V8_GMAP)

These developments correspond to the code entered in CY40t1

NEW_PREP and NEW_PREP_HIRLAM were tested using the automatic test procedure. The test of V8_GMAP is in progress.

Plans are now to phase the ISBA-TOP modifications (B. Vincendon) and the TEB modifications (V. Masson), before the climate group contribution (B. Decharme).
Note that the climate group contribution will contain the MEB, rotated grid and ECUME contributions.
Then, the final scientific contribution will concern CROCUS and VARASSIM.
The technical contributions will be entered after that : HIRLAM (Rimvydas Jasinkas and Ulf Andrae), Marco Koupianen (contribution discussed with Eric Martin, to be comfirmed with Stéphanie Faroux). And finally the removing of global variables by the CERFACS.

The automatic test procedure.
This procedure was developped during summer and autumn 2013. It consist of a serie of 2500 tests in offline mode. Several scripts are used and the results of the « old » and « new » versions are compared using a python programme that read the NetCDF outputs. On a PC, the whole process takes 48h.
Although not exhaustive, it covers a wide range of possible OPTIONS allowing the tests of side effects of a modifications. Ulf Andrea and Trygve Aspelien were the first to use it outside MF.

The suppresion of global variables in the code :
The suppression will consist of a succession of automatic scripts to :
- Prefix the variable by the name of their structure, using a short name for the structure : In this step, only one THREAD PRIVATE instruction is needed by structure (and not by variables)
- Pass the variables in arguments (with eventually some regroupments)

An important work is necessary to make the automatic scripts run. The result will be a SURFEX code with no global variables, that will be compliant with OOPS and facilitate the OpenMP maintenance for atmospheric models. Global variables will be declared by the host program (atmospheric model, or offline, etc.). A compatibility layer will be available in order to use the new code with « old fashion » style codes.
The scientific code, will not be affected too much, as global variables are passed through the arguments of the CALL. However some intermediate parts of the code may be affected.

3. SURFEX open source :
The v8 will be open source. Some preparation will be needed (adding of a licence, replacing Dr Hook library by a dummy, ...). The distribution will be done using a dedicated MF web site and github web site.

4. Moving from svn to GIT :
The move from svn to GIT is planned after the V8.

5. Optimisation of PGD/PREP :
The next step is to parallelize PGD and PREP. This work will be done by Stéphanie Faroux and begin in summer 2013 (will depend on the V8).