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SURFEX team activity

SURFEX steering committee
12/04/2022

Plan

1. SURFEX support team
2. Adaptation to new HPC architecture
3. SURFEX V9
4. Code Management with GIT
5. Code versioning

1 . SURFEX support team

Offline applications

- Today, user support is provided by Marie for SURFEX (help understanding the users problems, debugging... and Diane for ECOCLIMAP (specific issues, provision of maps...)
- Specific support on the ISBA model is provided by Bertrand and Aaron, on the TEB model by the team VILLE, on the 1D Ocean mixed layer model by Cindy and on FLake by myself. The support on the Crocus snow model is done by Matthieu and colleagues in CEN.

Coupled applications

- Adrien (GMAP) works in collaboration with the SURFEX support team for AROME and ARPEGE models.
- Quentin (GMME) works in collaboration with the SURFEX team for Meso-NH model.

1 . SURFEX support team

Evolution

- Antoine VERRELLE joined the support team (30% of his time)
- In the summer 2023 a new person will join the team (permanent position) to work on the SURFEX code (design, new HPC architectures...)
- A closer collaboration with GMAP (Adrien) will be set up to enhance communication on existing issues in NWP applications. Regular meetings will be organized (monthly basis) to share the problems and allocate resources from the SURFEX team to solve the problems in a limited time.
- Coordination with the ACCORD surface leader will be set up for the training sessions: SURFEX training course organized once a year, ACCORD training course (NWP oriented) organized twice a year.

2 . Adaptation to new HPC architecture

Task Force SURFEX

- Created in March 2021 to work on the adaptation of the SURFEX code for NWP applications (GMAP's request) and prepare to new HPC architectures.
- The problems identified: lack of modularity of the code and need to separate IOs, parallelisation, geometry and calculations.
- A prototype was design by GMAP in a very simplified environment to do it with an interface to ATLAS software (interpolations, but not only...).
- The conclusions of the group were:
 - ➔ Work on PGD and PREP could be based on the prototype but a huge work would be required, especially for PREP with all its specificities: stand by action for now...
 - ➔ The versioning of the code was discussed and actions were decided (see Marie's point below)
 - ➔ GitHub will be used for the code management after V9 and decision that GIT will be now mandatory for any code update (see Marie's point below)

3 . SURFEX V9

Reminder : what is asked to each merger

1. to merge developments with the version of the previous merger
2. to run the STRATO base of tests
 - to analyse the outputs
 - to be able to explain all differences
 - to provide outputs of STRATO
3. to provide a documentation explaining the differences
4. to update STRATO (new keys, new tests)
5. To update the SURFEX user's guide, each developer has to provide:
 - technical documentation of new developments
 - documentation all changes in namelists : new keys, new defaults values, etc...

3 . SURFEX V9

Contributors for SURFEX V9

done in progress

ALADIN	Coupling SURFEX to ALARO
CEN	Module SYTRON, coupling MEB/CROCUS, CROCUS-resort, Scheme of prognostic impurities, Multi-physics version of Crocus (ESCROC) ...
GMAP	ORORAD : Computation of orographic parameters for surface radiation interaction
TEB	improvement of BEM, model of behaviour of the inhabitants urban hydrology, ground layers under the buildings and the roads, CO2 fluxes in urban areas, radiative exchange calculations using SPARTACUS
TOPD	Improvement coupling ISBA/TOPD (hydrological model for flash-flood simulations)
Ocean	coupling with a wave model
VEGEO	Irrigation in SURFEX
Meso-NH	snow transport by the wind MEGAN chemical scheme
GMGEC	CMIP diagnostics Carbon flux
HIRLAM	
Surface	Improvement of MEB

Details about contributions : <http://www.umr-cnrm.fr/surfex/spip.php?article436>

3 . SURFEX V9

Due to the very long development time of V9, some of the contributions are now relatively old.

Consequently, after the end of the integration of the last contributions, a call for bugfixes will be proposed for the first contributors before the official release of the V9 version.

4 . Code management with GIT

After V9, the SURFEX code will be managed under **GitHub** environment.

Due to this change, adaptations will probably be necessary (STRATO, management for writing rights, etc...)

Future versions of SURFEX :

- to be accepted, a contribution must be made through a GIT branch, phased with the current version of the code. During the call for contribution, developments outside GIT, and not already phased with the current version will be rejected.

- The main teams of developers will have to organize, have their own branch of developments, and if possible, will have to identify on or two people in charge of managing their code under GIT.

4 . Code management with GIT

CEN	Matthieu Lafaysse / Mathieu Fructus
GMGEC	Bertrand Decharme / Gaëlle Rigoudy (?)
VILLE	Jean Wurtz / Valéry Masson
MNH	Quentin Rodier
SODA	?
OCEAN / AROBASE	Cindy Lebeaupin
HIRLAM	Patrick Samuelsson
GMAP	Adrien Napoly
ACCORD	Patrick Samuelsson / Adrien Napoly
CHIMIE	Joaquim Arteta

5 . Code versioning

After V9, code versioning practices will change :

- **Addition of a number for the name of the versions** : for exemple SURFEX 9.0.1

This third number will be dedicated to bugfixes. Currently, bugfixes are introduced in real-time, and there is no way to differentiate the V8.1 version between its creation and now. Several bugfixes will be introduced together, and will be identified by this number in the version name (each 2-3 months, depending of the number of bugfixes)

- **Call for contribution will be more frequent**, with smaller contribution. For example each year.