

CYCLES AND THE LIKES

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- Operational versions at MF
- R&D versions in the MF central code repository
- OOPS with DAVAI : the effective use of OOPS ... for debug
- Evolution of Code Integration and System activity

Aladin-LACE-Hirlam virtual all staff workshop, 30/03 – 02/04/2020

P&P at Météo-France : operational versions

- **CY43T2_op3** (15/01/20): snow analysis in Arôme-France; OPERA radar data assimilation; new satellite data assimilation (ScanSat1, NOAA-20, Metop-C); new diagnostics for aeronautics in Arpège (CAT, icing)
- **CY43T2_op4** (*switch to oper postponed*): new list of ground GNSS in Arp/Aro; assimilation of AMV/GOES-17
- Perspectives:
 - Finalize handover of CY43T2_op4 to Operations (*after confinement?*)
 - Migration to new HPC: delayed to summer-autumn 2020
 - **CY43T2_op5**: assimilation of AEOLUS
 - **Next scientific e-suite based on CY46T1_bf** + operational changes:
 - ▶ PEARP and PEARO have same horizontal resolution than deterministic models; IFS radiation and convection schemes in Arpège and PEARP; snow analysis and sea-ice model in Arpège, etc.
 - ▶ Timing (tbc): over much of 2021; maybe switch to operations by end of 2021

R&D cycles in the MF source code repository

- **CY46T1_bf:**
 - v02 exists but not fully validated;
 - In discussion: V03 (technical) / v04 (wrap-up of CY43T2_op3/op4)
- **CY47T1:** a technical update + bugfixes would enter a `_bf` branch (mostly for continuation of DAVAI results)
- **CY48:** construction in progress with ECMWF; effort for synchronizing OOPS/IFS-Arpège codes; time of declaration likely to shift into May
- **CY48T1 (Oct-Dec 2020):**
 - still planned for the autumn;
 - MF suggest to use DAVAI + mitraille, and build this T-cycle in a more continuous integration process (rather than a few big merge steps)
 - Call for contributions will be sent to GMAP, LACE/ASCS, ALARO main contacts; Hirlam System Coordinator; others to contact French LTM (Claude) and ACNA (Mariška)
- However, we are now in a situation of a *perturbed working environment*

OOPS developments at Météo-France

Use of OOPS in DAVAI to validate DA components :

- observation operator (nl/tl/ad),
- model integration (nl/tl/ad).
- single observation experiments in variational minimization.

=> DAVAI and OOPS have proved to be key tools
to maintain and develop DA components and formulations.

Integration and successful validation of
variational minimization in OOPS (46t1+47t1) :

- ARPEGE : 4D-Var, 4DEnVar.
- AROME : 3D-Var, 3DEnVar, and soon 4DEnVar.

Recent experience with OOPS/DAVAI for debug

- We aim at building a continued line of test configurations (and their results) from CY46T1_bf through CY47T1_bf and CY48.
- CY46T1_bf was a very difficult version to validate :
 - Last working version was CY43T2
 - After some code phasing, Arome 3D-VAR ran ... *until it crashed after 5 days of assim cycle* (CONGRAD : non positive Hessian estimate)
- How to tackle the problem ?:
 - rerun Arome-France 3D-VAR with PRINTs => costly & cumbersome
 - Use a toy version but must be able to reproduce the crash !
 - Luckily, **OOPS-based component testing of obs operators** became possible end of 2019 for LAM
 - => **3 bugs fixed**: T for conv obs ; Φ for conv obs ; wind rotation (X,Y) / (N-S,E-W) ; *all bugs were in the obs operator adjoint code causing wrong results in the corresponding AD test*

Evolution of Code Integration and System work

- Allow access to DAVAI (& OLIVE) from remote, for a *limited number* of partner staff => investigation in progress
- **Stepwise integration** of delivered codes for CY48T1
- **Towards a more flexible and visible code management** process :
 - Outcome from System TT lead by A. Mary & Strategy meeting
 - shared and accessible environment, documentation and ticketing tool etc.
 - MF has the central code repository
- R. Stappers : investigation about a shared environment for open-source codes used with the NWP codes
- **ECMWF/MF** discussion about improving efficiency of code collaboration :
 - Make more cross-testing, including LAMs
 - Address further evolution of code collaboration methods



hvala za vašo pozornost
