

Cycles installed at Météo-France:

CY37T1: mid-March/end-April 2011, provisional content (deadline for contributions is set on March 14th):

- Assimilation systems:
 - model error representation in ensemble assimilation, using innovation-based inflation of forecast perturbations (L. Berre & G. Desroziers).
 - Corrections in OI_main (Surfex related surface analysis tool) and CANARI (F. Taillefer)
- Observations:
 - filling of some additional ODB columns, introduced by ECMWF or to our request since the previous common cycle 36 with ECMWF, for SATOB and SCATT data (C. Payan)
 - update of the Aeolus decoding part, as much as possible (off part) – C. Payan –
 - Consideration (as much as possible) of new data from the OSCAT scatterometer onboard the Indian satellite OceanSat2. Impact in BATOR and possibly in ARPEGE (to be checked) – C. Payan -
- Arpège/Aladin upper-air physics:
 - 3D aspects for the transport of dust (M. Mokhtari and Y. Bouteloup): dry sedimentation, wet deposition, coupling with convection and radiation
 - modset for MUSC and for running EDKF in Arpège (Y. Bouteloup)
 - catch-up from CY36T1_op2 E-suite: microphysics/convection ordering, condensation/evaporation and negative temperature, modulation of convective entrainment and modulation of moisture convergence (F. Bouysse)
- Arpège simplified physics (O. Rivière):
 - Improvements for stratiform precipitations; TL/AD of convection; various cleanings for readability of the code and protection of impossible combinations of options
 - Introduction of the following processes in the microphysics: auto-conversion, collection, evaporation. Note: the melting of ice/snow precipitations around 0 deg. Celsius has not been introduced (this code produces modified numerical results with the non-linear physics on NEC, which was found problematic given the late introduction of the whole modset in CY37T1 => postponed).
- Arome and Aladin surface scheme: version 6+optimization of SURFEX:
 - Open-MP adaptations and other I/O optimizations
 - *Scientific content (for remainder): improvements for the dust model (Mohamed Mokhtari) => for Surfex V7 but the atmospheric contribution enters CY37T1 (APLPAR)*
- Dynamics and time step related code (tendencies etc ...) – Filip Vana -:
 - new options for phys-dyn coupling:
 - L[x]LAG=4,
 - LPHYLIN attribute for GFL fields,
 - extra and separate diffusion of physical tendencies.
 - 3D turbulence dataflow in dynamics (“2D+1D”):
 - LHORTURB attribute of GFL fields,

- 3D shear term preparation in NH dynamics,
 - Laplacian operator applied to appropriate GMV fields,
 - and physics:
 - computation of horizontal exchange coefficients,
 - extension of TKE equation by horizontal terms.
 - updated automatic setup of NPROMA for LAM domains
 - slight update of SLHD triggering based on divergence
 - Promoting consistent set-up of SLHD w/r to spectral diffusion setup when LECMWF=.T. (in coordination with Nils Wedi, ECMWF)
- Bugfix in DFI2 in order to properly run DFI (removal of a conversion $T \leftrightarrow T_v$): this fix has a major impact in dynamical adaptation mode, where it corrects a strong positive bias of temperature in the low levels (correlated with the field of specific water content Q_v)
- DFI for gridpoint fields (L. Auger)
- various code cleanings and algorithmic developments (K. Yessad):
 - code cleaning: re-arrange some of the LBC code in a more OOPS-oriented manner; removal of useless dummy arguments (FMR15); introduction of new structures in the dynamics, with some collateral, modifications in the physics-dynamics interface; introduce a new key in the surface dataflow (SURFACE_FIELDS_MIX) to say if fields are active, and use this key in MODULE_OBB1_MIX in order not to interpolate not allocated surface fields in the observation interpolator; reduce excessive modularisation at various places; remove variable LPC_OLD; remove information about modifications done before 01/01/2001; remove obsolete (unused) decks; some cosmetic cleanings
 - Fullpos: introduce multi-linear horizontal interpolations, introduce the mapping factor in the spectral filtering
- Alaro physics (Filip Vana as code contributor to the cycle):
 - updated TOUCANS code (Ivan Bastak-Duran)
 - code updates in link with the introduction of 3D turbulence as a 2D+1D algorithm (see item on dynamics above)
 - code for Cellular Automaton (Lisa Bengtsson & Filip Vana for optimization aspects)
 - fixes in convection/microphysics (Radmila Brozkova)
- Hirlam/Harmonie (Toon Moene):
 - Optimization features by S. Saarinen (incl. “samio”)
 - Surfex/Alaro
 - EDMFM code updates (W. De Rooy)
 - Miscellaneous Harmonie adaptations: LAM fix for Jc-DFI (evjcdfi.F90)
- DDH diagnostics (F. Voitus):
 - Dynamics terms added: Semi-implicit, Semi-Lagrangian transport, horizontal diffusion, valid for all models - ARPEGE/ALADIN/AROME –
 - Flexible 2D fields: for surface fields
- Adaptation of configuration 901 (conversion IFS to Arpège historical files) to GRIB2 upper-air input fields (Mate Mile & Jean-Marc Audoin)
- Optimisation of the Open-MP parallelisation in the spectral dynamics of Aladin/Arome (the existing Open-MP directives have been moved to a higher level in

the code, in order to reduce the overhead of the Open-MP start-up, and to have Open-MP applied to the non-hydrostatic dynamics as well as to the hydrostatic ones) – Ryad El Khatib & Fabrice Voitus –

- Some minor contributions w/r to GMAP's work for RAPS and benchmarking (REK)
- Climate group contribution (A. Alias):
 - Changes in radiation schemes; relaxation of mesospheric specific humidity; linear Ozone added; changes in nudging scheme

The cycle has been declared on June 30, 2011.

CY38: this cycle is scheduled for over September/October 2011. The first elements of IFS Fortran code cleaning in the OOPS spirit will enter this cycle.

- Encapsulation of LBC coupling code (K. Yessad)
- Some cleaning in MF's physics routines to prune coding norm violations (M. Jerczynski & Y. Bouteloup)
- Last catch-ups of Olivier Rivière's work on Arpège simplified physics: melting process of ice/snow precipitations
- Code for generating frame-formatted lateral boundary conditions from the IFS, and alternative bi-periodization method – L. Auger
- IFS cycle CY37R3

CY38 has been declared at ECMWF on November 10th.

CY38T1: deadline for contributions end of February/beginning of March

- SURFEX official release V7.2 & plug-ins in “mse” interface (to be issued by January/February '12):
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- Optimizations in the “mse” library for Surfex (concerns “prep” when called from Full-POS/e927, Philippe Marguinaud):
 - Use FA format for input/output file format (instead of LFI)
 - Compression of data (using a workaround for handling the masks)
 - Note: 2 FA files would be handled, one for constant surface fields (PGD) and one for the remaining fields (presumably mostly prognostic ones)
- Optimizations for CANARI (vector and scalar architectures) – R. El Khatib -
- E-zone treatment in gridpoint LAM model revisited (LNOEXTZ key: M. Hortal, Belgian team, based on specs by Ryad) & Boyd LBC coupling code (LFPBOYD: D. Degrauwe)
- Dynamics and cleaning (Karim Yessad):
 - Introduce an alternate way to compute the vertical displacement in the SL scheme (direct code only)
 - More flexible options for Rayleigh friction
 - Recode sponge to allow it in 3D models
 - Momentum equation RHS: code to be gathered at one location (under CPG_GP)

- New structures in the dynamics (types TXYB and TVAB): replace sequences GPPREH+GPXYB+GPPREF by a new routine GPHPRE, pass YDVAB instead of individual components in some GP.. and GNH.. routines
- Types TRCSGEOM, TRGSGEOM, TOROG: pass variables defined with these types in one step to routines under CPG, CPGTL and CPGAD
- GMV and GFL to be passed in one go to CPDYDDH and VPOS;
- CP_FORCING: move CPG_DYN into CPG_GP
- Reduce some calling tree complexity (remove SCAN2H etc.)
- New versions of GMPFC with less dummy arguments
- CPG5_GP: bugfix for code under LPROCLDTL
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- Encapsulation of spectral geometry arrays & making some Aladin setup routines mirroring IFS/Arpège one's (K. Yessad & A. Mary); collect all GFL setup into SUGFL (K. Yessad)
- Spectral nudging for coupling large scale structures in the LAM's (F. Voitus):
 - the idea is to estimate the tendency of {wind, temperature, pressure} by a finite difference between two successive coupling files, take the large scale part of it and relax the model tendencies towards these large scale tendencies at each model time step (this code uses the “old” key LTENC, which was coded for GP fields only);
 - complete externalisation of coupling and spectral nudging for temporal interpolation and relaxation
- ALARO physics:
 - Improved version of TOUCANS scheme: code impacts below APLPAR (increased numerical stability & debugging) – F. Vaňa -
 - radiation, microphysics, cloud scheme and convection (a few corrections and improvements) – R. Brožkova –
 - 3MT in Arpège (R. Brožkova & F. Bouyssel)
- ARPEGE/ALADIN physics:
 - Inclusion of PCMT code: creation of 6 new GFL variables, convection code (updraft, downdraft, link with microphysics), CPTEND_NEW, new associated diagnostics in DDH (J.-M. Piriou)
 - Upgrades in the EDKF scheme; match-ups w/r to MF's E-suite CY37T1_op1 (PROC team)
- MUSC 1D model: adapt JPFORC value, some further developments if ready (PROC team)
- Assimilation:
 - Phasing Bator with respect to MF's last E-suite version (preparation of ODB, F. Guillaume)
 - Wrap-ups from CY37T1_op1: tuning of σ 's for ASCAT winds; inclusion of GOES-15 data (C. Payan)
 - Updates for Arpège 4D-VAR in the spherical wavelet code, and for the representation of model error (L. Berre, G. Desroziers, H. Varella)
- Code inclusion in official libraries for the computation of LAM B-matrices: reference version of FESTAT & FEDIACOV codes (in the “uti” project/library) – Loïk

- HIRLAM (contacts are Ulf Andrae /SMHI & Niko Sokka /FMI): the whole modest in preparation is visible at <https://hirlam.org/trac/wiki/Phasing/cy38t1>.
 - New snow temperature computation (T. Aspelien)
 - Changes in Cellular Automata code and Rasch-Kristijansson convection scheme (L. Bengtsson)
 - Changes in cloud diagnostics: max random overlap including weighting for ALARO, cloud class diagnostic based on Z-height rather than model level for AROME (L. Bengtsson)
 - Changes in EDMFM/EDKF code (W. De Rooy)
 - Miscellaneous porting and optimization features in Surfex (T. Aspelien) => committed to the Surfex trunk V7.2 (S. Faroux)
 - Hirlam's spectral nudging facility re-coded in CANARI (O. Vignes)
 - Various fixes and porting issues (localized changes)

CY39: September/October 2012