

Cycles installed at Météo-France:

CY37: the decision was to build this cycle from end-August through mid-October; the pre-cycle has been sent back to Reading on October 26th. The official release was declared at ECMWF on November 24th.

- Catch-up of some late E-suite changes in Arpège and Arome
- Blending FA file optimization (J. Mašek)
- IFS contribution CY36R4 (August sending)

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. Bouyssel)
- 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
- 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)
- 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):
 - LAM code adaptations for switching off E-zone gridpoint calculations; key LNOEXTZ (by Mariano Hortal)
 - Optimization features by S. Saarinen
 - Surfex/Alaro & OI_main (M. Homleid)
 - Handle nearly constant fields in grib (FA) packing (U. Andrae)
- 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

CY37T2: most likely in June; this cycle would be devoted to catch up with the SURFEX official release V7. Otherwise, only technical bugfixes can be accepted (no operational input, no R&D input). The phasing and validation work is planned to be reasonably short.

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.

Progress and plans at Météo-France:

Plans for 2nd semester of 2010 & 1st semester of 2011:

Contents of the 2010/2 E-suites:

- “summer E-suite” (June/November 2010):
 - CY36T1_op1
 - Assimilation (global 4D-VAR as reference):
 - Assimilation of SSMI/S from 2 satellites
 - radiosonde bias correction scheme imported from IFS
 - assimilation of GRAS/METOP GPS occultation
 - assimilation of low-peaking AMSU channels over sea-ice
 - modified algorithm for handling ambiguous wind direction from METOP/ASCAT instrument
 - use Synop RH2m observations in daytime
 - upgraded OBSTAT code to take into account radar reflectivity and RH profile retrievals (would probably become part of an official CY36T2 release)
 - use of ensemble assimilation σ_b 's in the screening; use ensemble assimilation σ_b 's for specific humidity in Jb
 - TKE field is cycled (instead of restarting with default value 10^{-6})
 - Arpège ensemble assimilation installed in the operational scripting environment (replaces OLIVE supervision)
 - Arpège/Aladin-France upper-air physics:
 - Cloud sedimentation scheme: introduction of different fall velocities for cloud liquid and solid water
 - Changes in the microphysics scheme in order to prevent liquid water when a model column has negative temperatures at all levels (conversion to snow and ice)
 - Deep convection scheme: changes in order to increase the onset and effectiveness of the deep convection and thus, prevent small scale hyper-active systems
 - *Only in Arpège*: modifications in the specifications of the sub-grid variability of orography
 - Extra diagnostic outputs of cloudiness, Liquid water content, Ice content, Turbulent kinetic energy, hourly outputs for surface fields
 - Improved diagnostic scheme for computing the 0 deg. C. height
 - Relaxation towards the OSTIA SST analysis (Met Office) in all models (NCEP analysis still used over lakes)
 - Arome-France:
 - 80km thinning for IASI pixels; 25 km thinning for AIREP
 - revisit the blacklist for radar data; assimilation of more coastal radars (7 more radars, including 5 coastal locations)

- some tunings for reflectivity retrievals
- surface assimilation based on Surfex, with the 2m increments of T2m and RH2m computed using OI formulation
- Extension of the size of the horizontal domain (750*720 leading to an increase of 1.76 of the domain size)
- Use the Arome analysis file as 0h coupling data (instead of the Arpège-interpolated fields), as is done in Aladin with incremental DFI (but no DFI in Arome)
- Code optimization for fitting the requested elapse time for Arome/large domain: inside the ETKF shallow convection code, inside the I/O and message passing communications (especially in link with SURFEX)
- Diagnostic outputs: PBL height, surface radiation flux, modelled satellite imagery for SEVIRI channels 6.2 and 10.8 μ , removal of modelled reflectivity in the 0h output file

This E-suite has been launched end of June, and the switch to operations was performed on November 24, 2010.

- Definitive stop of the Arpège-Tropiques application on November 2nd; and of the Aladin-France production based on the very short cut-off Arpège “PACOURT” on November 4th. Associated to these stops: corresponding coupled MF wave models.
- PEARP Version 3 switched to operations on December 13, 2010 (increased horizontal resolution to T538C2.4 – 15 km over France – and changes in the initial condition perturbations)
- “winter E-suite” (start in January 2011):
 - CY36T1_op2
 - Assimilation (4D-VAR Arpège & AEARP):
 - New RT-coefficients for IASI
 - Computation of relative humidity made consistent between monitoring and assimilation for SYNOP
 - Monitoring of RARS/ATOVS over Pacific and Asia, EARS-La Réunion, & Miami, SSMI-S of F-18
 - inflating factor for σ 's for taking into account model error in Arpège's ensemble data assimilation
 - Arpège/4D-VAR simplified physics: new tuning of critical relative humidity in the Smith scheme (TL/AD code)
 - Arpège physics and surface treatment:
 - Removal of the relaxation towards climatology in the CANARI surface OI scheme for deep layer temperature, total water content, water content of the snow pack over continents
 - Changes in the deep convection scheme
 - removal of the calls to radiation on the first and last time steps,
 - take into account TKE at t+dt (instead of t-dt) when computing wind gust diagnostics
 - re-activation of the re-freezing of rain
 - Aladin-France: switch to SURFEX (based on Arome-FR version: ISBA3L, ...) & ECOCLIMAP. TEB and CANOPY are however *not* used.; new orography

computed from GTOPO30 using the prepPGD program; envelope orography is abandoned. The change to SURFEX will also be applied to the Aladin-La Réunion and Aladin-Outre Mer model versions.

- Arome-France:
 - Add an additional contribution to turbulence in the adjustment process, representing sub-grid variability of clouds
 - Use higher resolution input orography (GTOPO30): this change may force to sometimes reduce the time step in order to avoid a numerical instability (in link with too steep slopes over neighbouring grid points)
 - Revised low level drag (either a modified roughness length or a Beljaars-type of approach)
 - Introduce an information about the presence of hail (diagnostically computed)
 - Correction of a bug when specific humidity is grid point (concerns assimilation)