

**ALADIN LTM meeting**  
**Monday 5 October 2020**  
**14:00-16:00**  
**BJ/VC:**



**Document for Item 3.a in  
the agenda**

<b>Subject:</b>	Progress and plans: <ul style="list-style-type: none"><li>• status of common IFS/Arpège/LAM cycles,</li><li>• MF operational activities.</li></ul>
<b>Summary:</b>	Three main code versions are presently under consideration: <ul style="list-style-type: none"><li>• CY43T2_bf (ported export version),</li><li>• CY46T1_bf (planned as base version for MF e-suite),</li><li>• CY48T1 (next R&amp;D cycle).</li></ul>
<b>Information:</b>	<ul style="list-style-type: none"><li>• Suggestion is to consider CY46T1_bf (last version) for next base export version</li><li>• The next phaser visits to Toulouse might be planned for spring 2021, for CY49 (common with ECMWF), pending on Covid-19 situation and awaiting confirmation of timing of cycle within the IFS/Arpège coord. In the meanwhile, Olda and Bogdan will participate to phasing of CY48T1 remotely.</li><li>• For experimented staff only, remote participation to phasing could be considered also in future.</li><li>• MF HPC: shut down of beaufix/prolix by end of Dec 2020; then only belenos/taranis (new BULL-Sequana). Research HPC accessible to partners is “belenos”.</li></ul>
<b>Action:</b>	<ul style="list-style-type: none"><li>• Look out for potential participants, from the local teams, to phasing and code maintenance in 2021.</li><li>• Address the choice of the next export base version</li><li>• Technical information tbd:<ul style="list-style-type: none"><li>◦ pruning of “gribex” from FA (CY48T1)</li><li>◦ pruning of conf 901 (CY48T1)</li></ul></li></ul>

## Cycles, code releases and a few comments:

### **CY43T2\_bf latest upgrades:**

- v09 was built on 28 June 2018:
  - a few specific late fixes:
    - Fullpos/fpcorphy.F90 (R. Brozkova, R. El Khatib)
    - bator fix for HDF5 radar ODIM format (F. Guillaume)
    - changeset in Surfex/PGD codes in order to enable the handling of an E-zone in the native PGD file (A. Mary)
  - this v09 became the base for the first Aladin export version
- V10 as an incremental update of the Aladin export version, built on 27 February 2019 (input coordinated with LACE/ASCS and Aladin/ACNA)
- v11 with additional changes prepared by Aladin and Hirlam partners, under coordination by ACNA and LACE ASC, released on 25 June 2020. NOTE: for the file “arpifs/op\_obs/inv\_refl1dstat.F90”, please use version bf.10 (only active for radar DA)

### **CY46T1\_bf:**

Validation of Arpège and Arome applications (Arpège 4D-VAR, Arome 3D-VAR, EDA etc.) is ongoing based on CY46T1\_bf. Several upgrades of the bugfix version have taken place, in order to add corrections found while validating DA as well as to catch up with the last operational Arpège/Arome versions (from CY43T2):

- **CY46T1\_bf.04:** match up with CY43T2\_op4 and base version for a long run validation of Arpège 4D-VAR (2 month validation period in GMAP started with this version) [9 June 2020]
- **CY46T1\_bf.05:** 2 month-long Arpège 4D-VAR ran with accepted results + Arome 3D-VAR (actually using \_bf.03+) and AEARP. [2 Sept 2020]
- **CY46T1\_bf.06:** fix for ISP, any other fix needed by other applications (eg PEARP, PEARO etc.). Update by end of Sept or beginning of Oct 2020.

CY46T1\_bf can be considered for an export version.

**CY48: January – April 2020 (EC/MF planned timing in beg. Of 2020).** The timing was constrained by MF’s change of HPC, which was planned to occur in spring 2020. Porting the operational NWP suites to the new (BULL-Sequana) HPC would then take place from March/April onwards. This timing originally was rather in-line with EC’s planning for the move of their new HPC to Bologna (though delays for EC already were announced in late 2019).

With both the additional delays of the move of EC’s Data Centre to Bologna (now 2021) and the delays in installing and migrating to the new HPC solution in MF (now targeted for end 2020), the actual final timing of CY48 got shifted into the summer period. The declaration eventually took place on 3 Sept 2020.

**CY48T1:** The build process is proposed to be in two stages:

1. Oct-Dec 2020 with a trial process of quasi-continuous integration of contributions,

2. and an extension for finalization steps in January-February 2021.
3. More precise timing and milestones will be presented to all main system coordinators and contributors.

## Progress and plans for MF's NWP suites in 2020 and 2021.

Two main operational changes took place in the first semester of 2020, mostly dedicated to updates on the use of observations for Arpège 4D-VAR:

- **CY43T2\_op4**: on 5 May 2020. The scientific novelties include:
  - Assimilation of GOES17 winds
  - Monitoring of AEOLUS observations
  - Activation of Variational bias correction for ground-based GNSS data in the production analyses of 4D-VAR
  - Improvement of some observation pre-processing aspects (error tolerance threshold for AEOLUS, use of high level TEMP data when mid-level values were discarded in QC selection steps etc.)
- some specific changes in the Arpège assimilation have been implemented in operations on-the-fly, once routinely available:
  - **9 June**: assimilation of CrIS hyper-spectral IR radiances on-board S-NPP, change of the BUFR template for Norwegian RS
  - **10 June**: assimilation of temporary additional aircraft data, AFIRS and TAMDAR distributed by the aviation company FLHYT
- **CY43T2\_op6**: on 30 June. New observations have been added in the Arpège 4D-VAR assimilation:
  - LIDAR winds from ADM-AEOLUS
  - Data from 10 sensors from GNSS-RO space-borne geographical localization (constellation COSMIC-2A, FY3C, FY3D, PAZ et KOMPSAT-5) added to the 5 sensors already assimilated before
  - Assimilation of specific IASI data from MetopA/-B received at the DBNet local station of Tahiti/DIRPF in the production analysis
- note: **CY43T2\_op5** was a version label in preparation of the operational mirror NWP suites on the new BULL-Sequana cluster

Porting of the operational suites takes place in spring-summer 2020. A migration test computer is available in MF since November 2019. The goal is to declare the new (BULL-Sequana) suites ready for operations for December 2020. The old BULL HPCs are to be switched off by the end of 2020.

The first scientific e-suite on the new HPC is expected to be installed in the winter 2020-2021. The precise content is under discussion. The code base version will be CY46T1\_bf.

Provisional list of content:

- **CY46T1\_bf**
- 2020 scientific changes *after HPC migration* :
- Monitoring of Mode-S
- Snow analysis in Arpège
- Tuning of observation error stdev
- Note : work on IFS convection and radiation schemes is ongoing, as well as on the IFS/GWD scheme + revisited orography based on GMTED2010 (Tiedtke-Bechtold, ECRAD, GWD)
- Arome aspects :
  - Revisited choices for diffusion
- EPS :

- PEARP (global) : revisited multi-physics choices, research work on SPP, *horizontal resolution equal to deterministic Arpège*
- PEARO : research work on SPP, stochastic objects and post-processing, *horizontal resolution equal to deterministic Arome-France*

**Outlook to MF plans for 2021-2024:**

- S2/2021: e-suite content to be confirmed (physics?, new observations?)
- 2022 : some OOPS binary ported to operations, with implementing 3D-EnVar in Arome-France (under discussion)
- 2022+ : Renewed surface assimilation ??
- 2023 : 4D-VAR Arpège with OOPS, or hybrid 4DVAR/4D-EnVar (or this config only for EDA?)
- 2023 : 4D-EnVar in Arome ?
- 2023+ : Instances of Arome-500m become operational