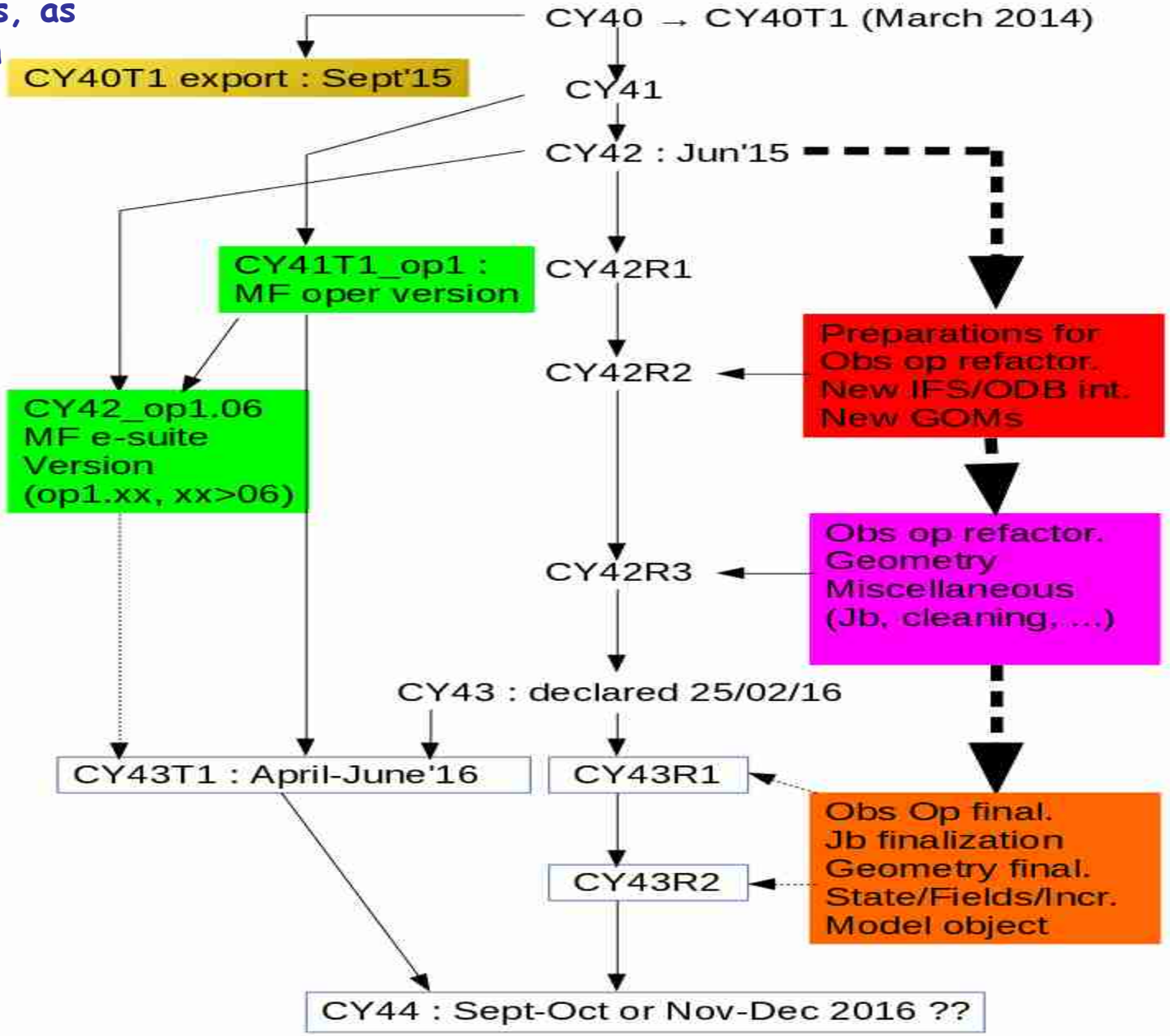
Phasing

Claude Fischer, Météo-France/CNRM/GMAP

Code collaboration with ECMWF

- One joint cycle with ECMWF about every 9 months: IFS/Arpège CYnn; LAM models are phased at the same time (and tested); exchange of codes via tar-files
- Physical coordination meetings for IFS/Arpège at the time of a joint cycle => **content & timing of next cycles**
- Videoconference coordination meetings (about 2-3 per year)
- Technical videoconferences: about 6 per year
- MF/EC meetings involve Aladin and Hirlam
- OOPS => IFS Fortran code re-factoring is implemented and phased with IFS cycles

A graphical view of the present cycles, as an illustration



With the partners: contributions and validation

- One interim cycle, with MF, Aladin and Hirlam contributions, in between joint IFS/Arpège cycles: CYnnTx; global and LAM models are both tested
- Code contributions:
  - for Aladin, mostly via Alaro team experts;
  - for Hirlam, coordination and streamlining via Expert Team and their coordinator. Hirlam have one E.T. member designated for a given cycle ("Star-like" coordination).
- Sanity checks: assess a series of simple, elementary tests
- What is "mitraillette" ?: a set of namelists, a set of scripts, a set of input files, a super-script to launch jobs automatically in a row
- Addresses forecast models (adiab, physics, TL/AD) and Full-POS mostly. Update to a new version can be cumbersome (namelists, input files, redo a reference).
- "CMCs": models including physics might require a more careful evaluation (norms, plots, series of forecasts). Update in mitraillette requires expertise (correct options, redo reference)
- About 400 jobs when the full mitraillette is run

Phasing aspects

- To build a cycle lasts about 3 months (difficult to do longer)
- Aladin visitors to Toulouse: about 1 FTE/year
- Technical validation (mitraillette) => declaration of a cycle in practice once models+Full-POS are considered as validated
- DA components:
  - Sequence over time: (1) build an ODB file; (2) check screening; (3) check minimization; (2b/3b) check CANARI; (4) run DA cycle over a one/two week period at least
  - 4D-VAR and cycling tests only start *after* models are well validated
  - LAM 3D-VAR usually tackled after global 4D-VAR
  - Specific expertise needed, not always available « on the spot »
  - CANARI: one expert staff for the code (FT)
  - *Alas, validation of DA is done much later than cycle declaration*

A few intermediate thoughts …

- Central SCR at MF: IFS/Arpège + LAMs
  - Mirror SCRs: why not ? But need to follow the same policy of base versions (same « root mirror ») => CYnn, CYnnTx. Other code versions should be branches: CYnn_dev1, CYnnTx_dev2.
  - Is a same SCR tool required (eg. GIT) ?

- Upstream coordination meetings to discuss the « science of the codes » are mandatory, but require resources and preparation (eg. the IFS/Arpège coordination meetings)

- Scientists ideally should include in their workplan the potential need to exchange the codes => pre-phasing should become more natural, as well as a common understanding of how to implement changes in the code

… and thoughts

- New test configurations in mitraillette ?: which ones are priority ?, need to share their maintenance !

- Decentralize some validation of DA components: must stay simple, should remain within the time lapse of a cycle declaration (~ 2-3 months), requires resources and specific expertise, the contacts for the coordination of questions/problems/fixes need to be well defined & *ensure a clear separation from expectations for Quality Assurance*.

- OOPS provides test programs of base classes and more complex classes of DA: use these tests to build a common testbed for DA components (an « OOPS-mitraillette » for DA)

- Visits of Aladin phasers in GMAP seems still beneficial to several teams (build know-how), and for GMAP phasing resources.

From central declaration to porting in remote centres

There is by necessity a time gap between the declaration of a cycle in a central SCR, and its installation in various partner centres

=> bugs and fixes will be reported/corrected possibly far after the cycle declaration in the central SCR

⇒ Will have to manage/coordinate "new" bugs/fixes for "old" code versions

⇒ Report on e-mail list ? Web forum ?

⇒ Use a more sophisticated reporting tool ?? => avoid new manpower needs for administration and maintenance of the tool itself !

Whatsoever, can Aladin and Hirlam do more common work for the versions installed in the partner centres ?

Incentives from the borderline

- Hirlam review outcome: should implement decentralized phasing mechanism ("more modern")
- ECMWF: technical project management tools (Confluence, JIRA, Bamboo) used in the Scalability projects … but not (yet ?) for the IFS ?
- Teleconfs seem more and more necessary, but to prepare them is *real* work (and the systems sometimes break down !)
- Adaptation of work practices to the software evolution itself ? (integration v/s phasing: SURFEX, ATLAS/MIR, etc.) => raises the issue of how to coordinate the evolution of IFS/Arpège/LAM codes with respect to *a number of* "exogenous" code projects (with their own management, versioning, validation)