# A tentatively brilliant overview of cycles and objects

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- Cycling activities
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# Part 1

## cycles

# Cycling (at present)

- **CY38T1: March 5 – April - May**
  - Dynamics cleanings; more flexibility in MF's horizontal diffusion settings
  - DDH: complete budget including dynamics
  - Use of spherical wavelets in Arpège
  - Wrap-up of E-suite modset: tuning of σo's, physics
  - Finalize code for new convection scheme PCMT
  - Arome physics (E-suite), extra radars, SURFEX V7.2
  - LBC coupling and E-zone treatment (new options)
  - Full-POS: part of the algorithmic overhaul (spectral computational aspects)
  - CANARI/OI: new structure functions linked with Euro-4M work
  - Optimizations: surface files, CANARI
  - ALARO physics changes
  - HIRLAM/HARMONIE

- **CY38T2 ??: between mid-May and June (if any)**

# Cycling (one year outlook with focus on code stuff)

- **CY39: September/October 2012**
  - Contents of CY39R1-3 of IFS/ECMWF: new Fieldset Fortran code, some re-arranged Setup, horizontal SL interpolators made external from the IFS, initial part of a Phase II of the overhaul of the code for observation operators, code adaptations to be able to run the OOPS 3D-VAR demonstrator on AMSUA-A radiances
  - Some extras (Full-POS algorithm)

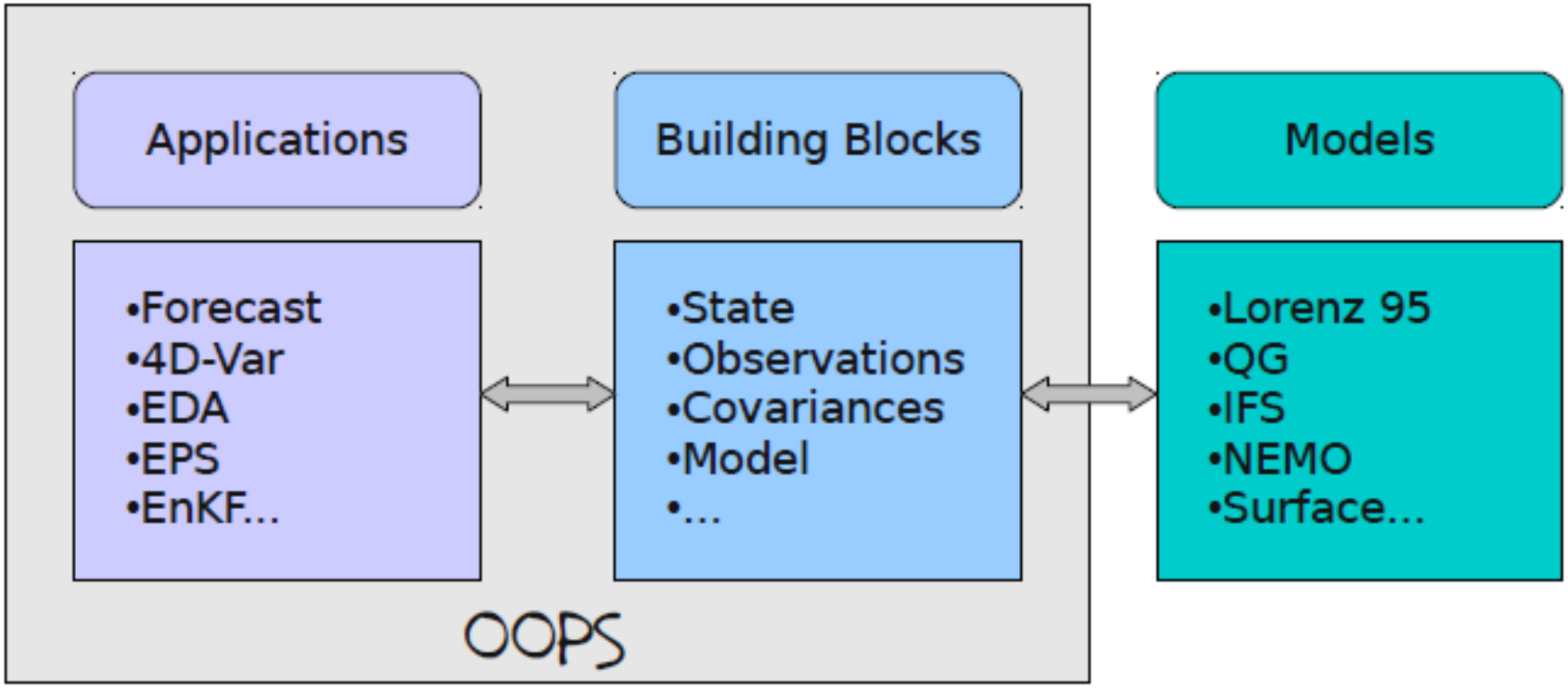
- **CY39T1: November/December or December/January 2012-2013**

- **CY40: March/April and April/May (leaving some back-up window in June). Release of CY40 must be completed in June 2013 the latest. The exact timing will be decided at the June 28 IFS/Arpège coordination meeting.**
  - Work on SL interpolators
  - Obs-interpolation restructuring, final part
  - Further break-up of setup routines (=> LAM)
  - Cleaning of CDCONF
  - Command line (part of it)
  - GFL/GMV cleaning
  - Enable more than one geometry
  - Call only GPHPRE
  - Optimization in the lateral coupling

# Part 2

# news from OOPS

# What is OOPS?




- The high levels tasks use abstract building blocks.
- The Models implement the building blocks.
- OOPS is independent of the application being driven.

# How in practice ?

- object oriented coding for applications & classes (entities): data hiding, Polymorphic features
- C++ and C++/F90 interoperable interface
- IFS Fortran re-factoring: pack variables into derived types; tidy up calling trees; Tidy up data layout; basic cleaning & pruning of options
- re-factored code enters regular IFS/Arpège cycles, started with CY38

# Expected benefits

• build in more easily new DA algorithms; able to assess them at control level
Using the toy models (or any model) first
• complexity of present VAR code becomes less at logical level (one might say
This is to some extent replaced by complexity of a new programming language)
• enable Unit testing of pieces of the algorithm
• in IFS: simpler interfaces, blocks of data handled by Pointers instead of a
Tremendous amount of global variables, parameters should be defined « closer »
To their computational code.

# IFS Fortran re-factoring: topics presently under discussion with ECMWF

- observation operators: Phase II overhaul (proposal by ECMWF)
- more flexible horizontal interpolators (for SL, Obs op; not for FP or clim)
- rationalization of GMV/GFL data structure
- break-up of Setup towards OOPS constructors/destructors => continuous effort; needs to be monitored w/r to impacts on Arpège and LAM codes
  - define Geometry object
  - disentangle Geometry/Domain/MPI aspects from the rest of Setup
- continuous pruning of code; new coding norms enforced
- progressive removal of CDCONF & command line options
- reminder from CY38: new Jb structures (code for B in VAR)

# Object-oriented C++ layer & LAM

- technical review of code in June/July 2011 (summary outcome available from ECMWF)
- scientific review based on an upgraded version able to perform a 3D-VAR using AMSU-A radiances (IFS version): end of May – August 2012
- C++ tutorials: at ECMWF & MF; soon one in Spain/AEMET
- OOPS/LAM days at ECMWF in February, followed by working days in Norrköping in March => initial actions oriented towards LAM applications have been discussed and will start soon:
  - LAM version of OOPS QG model and VAR
  - adaptation of Fieldsets to LAM
  - simple C++ wrapper code to test multiple LAM State instantiation

# Part 3

## miscellaneous about dev activities within Aladin (non exhaustive !)

# Some of the major code/software dev's

- Full-POS: several streams of dev are under way or foreseen
  - Make FP a truly multi-truncation in-core software (T. Dalkilic, REK)
  - E'-zone treatment (spectral transforms; Daan Degrauwe based on an implementation proposal by REK and the earlier work by Hirlam)
  - Extend FP towards Interoperability adapters (Daan D.)
  - Phasing of Interoperability adapter code into the official releases
  - Make FP more OOPS-compliant (in terms of its interface & cleaning of global variables)
  - FP and PREP/Surfex ?
- CANARI optimization efforts for both scalar and vector HPC: see REK's talk
- Developments of the IO server (Ph. Marguinaud)

شكرا على اهتمامكم