

**OOPS technical video-conference of January 27, 2014**  
**meeting number 5 towards CY41**

Participants (MF) : Claude Fischer, Karim Yessad, Ryad El Khatib, Alexandre Mary

Participants (EC) : Deborah Salmond, Tomas Wilhelmsson

Participants (LAM): Daan De Grauwe (RMI), Ole Vignes (Met.no)

This meeting was the fifth one, planned for discussing the Fortran re-factoring until CY41. It was the first since the last IFS/Arpège coordination video-conference (Dec 9). The main item today was the preparation for the MODEL variables encapsulation. The wrap-up of actions decided at the November 20, 2013 video-conference will be done at a forthcoming meeting.

**1. Various aspects of code preparations towards CY41:**

1. Deborah informed that EC had now a branch containing RTTOV-11 on top of CY40R1. The code is in final stage of validation (a fix for the vertical interpolation in the stratosphere has been added). At the time of implementation, the RTTOV-10 code will be deleted from the IFS (only version 11 will remain in CY41). The changes in output results are expected to be only numerical, and should be meteorologically neutral. The RTTOV-11 code is going to be implemented in CY40R2 (March). EC are testing new RT-coefficient files, but those will be ready only later in 2014.
2. EC will also implement the technical code changes for portability to their new CRAY, in CY40R2.
3. Claude informed that MF were now busy with debug and validation of CY40T1. It is expected that this code release can be declared by about mid-February. Other technical work concerned the installation and testing of CY40R1+TJK branch on BULL. Furthermore, in preparation to CY41, MF and Hirlam have started to exchange codes for the phasing of the LAM components.

**2. MODEL variables encapsulation:**

Tomas explained the technical steps for encapsulation of the MODEL variables:

1. a list of MODULEs to be encapsulated is defined
2. DERIVED TYPEs are implemented manually in the listed MODULE files
3. the Python script allows then to USE the variables from the new DERIVED TYPE structures. An option in the script (A/D) can be adapted per module/variable in order to ask for either using the DERIVED TYPE variable in the computational code, or using the ASSOCIATE trick

Tomas will send a finalized version of the script to MF (note: an early version was already sent before the meeting). It's then highly recommended to play with the options and carefully check the outcome code. The level of implementation of the ASSOCIATEs can be dependent on the readability of the outcome codes. Tomas will apply the ASSOCIATE trick to those MODULEs that are presently "tomas-tricked" in the TJK branch (GEOMETRY related MODULEs). The names of

the derived types are constructed by a simple rule: YOM[] become YR[]. MF will apply the Python script to some of the Arpège variables, and perform efficiency and reproducibility tests on their new BULL. Contacts at MF will be Etienne Arbogast and Karim Yessad. The visual checks will be done with involving some modellers.

Actions:

1. Tomas to send updated version of Python script, and TJK branch with ASSOCIATED variables
2. MF to apply the script on Arpège MODULEs: visual check, binary execution test + performance

During the discussion, several general aspects were addressed. For instance, the encapsulation can be done incrementally, and a mix of encapsulated and classical (global) variables should work for the classical Fortran IFS with mono-instantiation. Daan suggested before the meeting an alternative solution to the ASSOCIATEs, based on pre-compile directives (#define). This solution was considered to not be equivalent to the ASSOCIATE-trick. Furthermore, pre-compile directives are a feature which is not recommended for the IFS coding (though they are a few).

## **5. AOB**

- Karim mentioned that he had some proposals for further code/variables re-arrangements. Those could be implemented during the phasing towards CY41 in Toulouse, if agreed. Karim will send this list to others. He also mentioned he had started to brainstorm on the handling of TSTEP in the code (this is however an item for after CY41).

## **6. Timing of next meetings**

The next technical video-conference is on February 20, 2014 (1.30pm UK; 14h30 MET).

The next IFS/Arpège coordination meeting is by video-conference on March 18.

The next physical IFS/Arpège coordination meeting will be held in Toulouse on June 2, 2014. This meeting is back-to-back with the OOPS Steering Committee (June 3).

## **List of Actions (reminder from the Nov 20 technical video-conference):**

1. Deborah and Stéphane shall liaise during the phasing process of CY41 in order to perform the rename/move changes of Appendix E in the most optimal way. The Aladin “ald” routines will be changed in MF during the same phasing.
2. Geometry/Setup/OOPS-IFS forecast/STEPO\_OOPS code changes, and work at MF on an OOPS-Arpège prototype forecast. MF will give feedback about the Arpège prototype porting to EC at the next video-conf.
3. Alan Geer would send an e-mail to MF, about the work towards a single call to COBSALL and the results of validation (contacts: Eric Wattrelot, Jean-François Mahfouf, Claude Fischer)

4. encapsulation of Model-related global variables (automatic script and ASSOCIATE statement):
  - 4.1. Tomas to write Python script for encapsulation and association of variables
  - 4.2. all: test script and check resulting code
  - 4.3. resume technical discussion at next video-conference
  - 4.4. if this implementation is accepted, agree on which modules (list) should be refactored this way
  - 4.5. address the cycling and calendar aspects at the IFS/Arpège coordination meetings
5. cleaning in SUVAR and SUDYNA:
  - 5.1. Karim will send a minimal list of Setup cleaning proposals for after CY41 to EC
  - 5.2. Tomas will write down recommendations for general Setup ordering, especially in order not to break specific Object-oriented rules (like a Geometry should be fully initialized without a Model dependency, so a Model can be defined from it)
6. evolution of the VarBC code:
  - 6.1. Ulf to send e-mail to EC and MF about which issues Hirlam found
  - 6.2. MF informed the partners that they will study how to have more flexibility in the choice of the VarBC predictors in Arome (with respect to Arpège). This may lead to proposals for implementing some flexibility. MF will inform EC and Hirlam when ready. Contacts in MF would be Louis-François and Vincent Guidard. At EC, Alan Geer.