HARMONIE System Working Week

Oct 13-17, 2014, Bratislava

Report

M. Derkova (ACNA), O. Spaniel (RC LACE ASC)

The HARMONIE System Working Week (WW) has been organized in the week from Oct 13 to Oct 17, 2014 at Slovak Hydrometeorological Institute (SHMU) in Bratislava, Slovakia. The WW was kind of continuation and an extension of the Ankara 2013 WW, in frame of further convergence between ALADIN and HIRLAM consortia in the cooperation on the system/code maintenance and validation. 9 colleagues from ALADIN Partners were participating, 3 lecturers from HIRLAM and 6 members of local SHMU staff (including ACNA and RC LACE ASC) - see the list of participants below.

The main topics for the WW were:

- installation of CY38T1_bf03 under HARMONIE (with the emphasis on the "T" version);
- installation of HARMONIE system including 3DVAR on local platforms, training of newcomers;
- installation of missing ALADIN system components (e.g. DFI blending) under HARMONIE system.

Prior the WW two types of preparation activities were held to facilitate the course of the WW:

- installation of the HARMONIE system on SHMU HPC platform (IBM). This was done by O. Spaniel and R. Zehnal, with non-negligible online support via e-mail and google hangouts from HIRLAM colleagues. Ulf, Roger and Trygve are highly acknowledged for their help. Both H and T versions were installed and tested using testbed configuration and ALARO setup on HU8km_49lev domain with ECMWF coupling and MARS data. About 7 working days were needed in total for this task.
- ALADIN participants were inquired about their experiences with HARMONIE system, about their expectations from the WW and about the technical specifications of their platforms/compilers where the HARMONIE system was to be installed. This is summarized in the table below.

Four types of work were envisaged, from which finally only 2 were used:

- installation on the local platforms at NMSs
- installation on laptops
- runs at ECMWF
- user accounts on SHMU platform (backup solution, finally used only by SHMU staff)

The working week arrangements were informal and flexible, including the Agenda. There were six presentations planned and two more added upon the request in the course of the WW. All presentations are available on the HIRLAM wiki page[1]:

1. M. Derkova: Introduction, organizational matters
2. O. Spaniel: Technical aspects, HARMONIE verification in LACE
3. U. Andrae: Introduction to HARMONIE
4. R. Randriamampianina: Data assimilation in HARMONIE
5. M. Bellus: Blending by DFI
6. T. Aspelien: SODA and surface assimilation in HARMONIE
7. *U. Andrae: Introduction to svn*
8. *O. Spaniel: Harmonie verification package*

[1] hirlam.org/trac/wiki/HarmonieWorkingWeek/System201410_bratislava

The main activity during the WW was the installation of the HARMONIE system on local platforms or on the laptops with the assistance of HIRLAM and SHMU colleagues. The daily progress was regularly checked and reported via google sheet[2]. Local installations were successful in AT and SI. Other Partners had to overcome too many technical problems that had to be consulted with their local IT staff or HPC providers. Nevertheless, CZ (trial on HPC was not even planned) and TU managed to install and run on laptops. PT, HR and BE have to continue at home. The full installation/running progress summary is given in the table below.

Besides the HARMONIE installation following tasks were accomplished:

- *The work on the validation of blending by DFI configuration was performed*. Tools for blending by DFI were pre-implemented by Trygve using existing HARMONIE components, consulting with M. Bellus and M. Derkova. It was technically running on experimental domain prior the WW. The validation based on the SHMU operational configuration has started during the WW, but were not completed. Few problems were identified, for example HARMONIE does not recognise domains with different dx and dy (what is the case for some ALADIN domains including SHMU for historical reasons); there is no option for quadratic grid; the creation of blending-specific climate files (where grid-point resolution remains as in target model and the spectral one is changed) was not yet included in HARMONIE in a clean way; the simple tool for blending parameters computations could be designed etc. The work will be continued.
- *Few modifications for ALARO were added and bugs fixed*: to run on T branch; to couple with Arpege (missing ALARO fields in e927 namelist for this option); to use different options to smooth orography in e923 (creation of climate files), bugfix in mlis0r.F. All modifs were/are to be checked in T branch of CY38 in HARMONIE. In fact all participants of the WW were given the rights to commit changes in that branch in order to profit from relevant tests/upgrades.
- The shortcomings of the *verification package* (namely for LACE purposes) were pointed out. For the time being the combination of forecasts with different forecast lengths in one verification plots leads to displaying the scores only up to the shortest forecast (not all LACE NMS run up to +72h). Similarly, combination of several domains leads to scores computation over the overlapping area only (logical but not so obvious to users). It is not clear how NMS send data for minimum and maximum 2m temperatures: do they reset the validity interval according to SYNOPs (i.e. at 06 and 18UTC) or do they send hourly data and the verification software is supposed to find maximum/minimum over the time interval?
- The *OPLACE data support* in HARMONIE was enhanced. The existing setup was coded for one dataset per 24h. Modifications were made for 6h assimilation window. It is required to make *Preproc_oplace* script flexible and adaptable for local implementations of observation data processing.
- A further usage of HARMONIE system at Partners' NMSs and potential of HARMONIE system in closer collaboration on the code/system maintenance and common validation of new cycles releases were discussed.:
    - HIRLAM lecturers expressed their impression by the enthusiasm of ALADINers to install and use HARMONIE system;
    - it was noted that the first installation on a given platform requires a lot of work. The installation of required packages (e.g. perl) and compilation of the code itself takes much longer than expected;
    - *gmkpack* was recommended to be used in HARMONIE within the WW, as it was supposed that Aladin people are familiar with it. It turned out that for some participants the less complex but more costly *makeup* was easier to use to compile the code. ;
    - it is possible to install HARMONIE system locally with on-line support of HIRLAM colleagues (e-mails, google hangouts), as shown by SHMU example. In other words, if in

[2]https://docs.google.com/spreadsheets/d/1VAuHLuFiYVIyd6D8VJfl6n7WlWFWHl76Ads6iXDXd3k/edit#gid=0

future similar HARMONIE system WW is organized for ALADIN, it should not be focused on the system installation itself.
    - indeed, the next (HIRLAM) HARMONIE training will be probably focused on climate community of HARMONIE users
    - all ALADIN partners consider HARMONIE system as a very useful and promising tool namely for experiments (especially for AROME), for testing various options in data assimilation setup (e.g. VARBC), for educational purposes;
    - none of the participants has clear short-term plans for its operational usage;
    - anyhow HARMONIE system is having great potential for further collaboration;
    - it was stated that ALADIN setup shall be part of the sanity check (T branch, Arpege LBC; blending and oplace 2be reflected in config files);
    - it is important that all concerned countries put their config files and potential modsets in the T branch in order to bring them back to the main stream of the development;
    - the installation problems in BE, HR and PT in particular, and others in general, shall be followed up to complete the mission of the WW (see also the WW table - the last column with the final status);
    - the information flow is not very clear: who should inform whom about bugs/bugfixes? Meteo-France (MF) is responsible for repository, but they do not inform Partners about every bug that is found/fixed. HIRLAM reports bugs to MF. There exists the LACE forum, but this is only secondary source of information.
    - it is clear that MF mitraillette tests comprise namely model and fullpos options. It is not so easy to validate assimilation configurations => there is a potential for collaboration on common testing.
- Few [provocative or not so widely discussed] remarks:
    - if HARMONIE platform is to be used as a common tool for validation (potentially also for development) => ALADIN Partners would commit changes to HARMONIE. What will be the role of MF then? And what will be the role of T version?
    - as several ALADIN countries are not ECMWF full members (=> do not have CPU on cca), would it be worth to apply for a special project at ECMWF on common validation (and training)?
    - could the next step of collaboration be that ALADIN people participate at the HIRLAM system Working Weeks dedicated to validation of new code releases? HIRLAM welcomes such option. Who would be potential ALADIN candidates, as there are no dedicated system-responsible persons? Would it be enough just to send somebody “experienced”? Shall such WWs be part of the flat-rate budget?

List of participants

ALADIN	**HIRLAM**	**SHMU**
Mohamed Anis Sattouri (TU)	Ulf Andrae	Oldrich Spaniel
Alena Trojakova (CZ/LACE)	Trygve Aspelien	Martin Bellus
Maria Monteiro (PT)	Roger Randriamampianina	Maria Derkova
Tomislav Kovacic (HR)		Jozef Vivoda
Mario Hrastinski (HR)		Michal Nestiak
Florian Weidle (AT)		Martin Dian
Christoph Wittmann (AT)		
Olivier Latinne (BE)		
Jure Cedilnik (SI)		

name	country	platform	experiences	expectations	final status
Ulf Andrae	HIRLAM	cca	some	High!	
Roger R.	HIRLAM	cca/linux	some	High!	
Trygve Aspelien	HIRLAM	sgi/linux	some	High!	
Anis Sattouri	Tunisia	IBM p690	none	install	laptop: testbed running on h; t compiled; IBM 2continue @home
Alena Trojakova	CZ/LACE	NEC	trial to install (unsuccessful)	OPLACE support	ALARO testbed installed on laptop; support for OPLACE and verification
Maria Monteiro	Portugal	IBM p7	HARMONIE@ECMWF (radar DA), UBUNTU with Roger 2y ago	install, verif, OPLACE, h->t convergence, radar assim tools, SODA	h compiled but not linked; 2be continued with Francois Thoma
Tomislav Kovacic	Croatia	SGI	work with config file and Makefile	3dvar+canari, verification	h version compiled, no MASTER; to restart @home
Mario Hrastinski	Croatia	idem	none	installation	idem
Christoph Wittmann	Austria	SGI	none (gl installed)	install@ZAMG, verification	local ALARO running with T (-SURFEX, -3DVAR); verification monitor installed & working
Florian Weidle	Austria	idem	idem	idem	idem
Olivier Latinne	Belgium	SGI	none with HARMONIE, but with SMS	3DVAR+CANARI, EPS	rootpack not built; 2continue @home
Jure Cedilnik	Slovenia	SGI	@ECMWF (Bmatrix); installed but not used @ARSO	get insight; later: make compatible with ecflow	h&t versions compiled, TEST_11 tested
Oldrich Spaniel	SK	IBM	verif part installed/used	3DVAR, SURFEX(?)	running :) 38t1_bf03; testbed
Martin Bellus	SK		none		DFI blending under validation
Maria Derkova	SK		idem		HU domain with 3DVAR; SHMU domain
Jozef Vivoda	SK		idem		high-res 1km domain running
Michal Nestiak	SK		none	install, 3dvar	AROME/HU
Martin Dijan	SK		idem		