

**ECMWF/LAMcoupling Special Project**  
**“Road book”**  
**C. Fischer acting as P.I.**  
**S. Kertesz acting as Technical Coordinator**  
**May, 1<sup>st</sup> 2006**

Country Member/ Cooper./ None	Fax	Email contacts	Users to be registere d in the S.P.	User account s (if relevant )	Ecgat e and Mars	HPC F	SecurID card registere d to the S.P.
Austria (M)	43 01 3602673	Yong Wang	Y. W.	kah	yes	yes	
Belgium (M)		<i>Piet Termonia</i> <i>Olivier Latinne</i>		None None	No No	No No	
Croatia (C)	(+38) 514565630	Stjepan Ivateks-Sahdan Tomislav Kovacic	S. I.-S. T. K.	cr8 hr3	Yes Yes	Yes Yes	
Czech Republic (C)	+420- 244032218	Martin Janousek Richard Mladek Radmila Brozkova	M.J. R.M. R.B.	czj czr czb	Yes Yes Yes	Yes Yes Yes	
France (M)	33 5 61 07 84 53	Bernard Chapnik Claude Fischer	B. C. C. F.	rm9 rmp	Yes Yes	Yes Yes	
Hungary (C)	36 1 346 4629	Sandor Kertesz Gergely Boloni Andras Horanyi Laszlo Kullman	S. K. G. B. --- L. K.	hun hub hur huq	Yes Yes Yes Yes	Yes Yes No Yes	No
Morocco (N)	212 22 91 37 97	Rashyd Zaaboul Karam Essaouini Siham Sbii	R. Z. K. E. S. S.	caz cae cai	Yes Yes Yes	Yes Yes Yes	
Portugal (M)	(+351) 21 840 23 70	Maria Monteiro <i>Joao Ferreira</i>	---	pte pt7	Yes Yes	Yes No	No
Romania (C)	+40-21- 316.21.39	Cornel Soci	C.S.	roa	yes	yes	
Slovakia (N)	+4212 5477 4374	Martin Bellus Olda Spaniel Jozef Vivoda	M.B. O.S. J.V.	cab cas cav	Yes Yes Yes	Yes Yes Yes	
Slovenia (C)	386 1 478 4052	Jure Cedilnik Neva Pristov Mark Zaggar	J. C. --- M. Z.	sic none sir	yes no yes	yes no yes	No

**Registration process (proposed by ECMWF):**

- Already registered users from member states, having accounts with full access, will simply be added to the Special Project accounting.
- Already registered users from cooperating states, having restricted access (no HPCF), will keep their accounts, and get the extended access to HPCF.
- Not registered users, from member or cooperating states, having no account at ECMWF, are invited to ask for a personal account through their national contact point. This contact point can be checked at:  
<http://www.ecmwf.int/services/computing/help/reps/index.html>. This point would be relevant for Tomislav Kovacic (Cr), Piet Termonia (Be), Olivier Latinne (Be), Laszlo Kullman (Hu), Jure Cedilnik (Si), the Portuguese newcomer. Once accounts are created, they will also get the access to the Special Project facilities (HPCF) and accounting.
- Other state representatives (Morocco, Slovakia) will get user accounts and accesses only through the Special Project. Thus, they will receive SecurID cards directly from ECMWF or the S.P. management, on the behalf of the Project only.

**Technical coordinator (Sandor Kertesz):**

- TC prepares a status document about Arpège/Aladin/Arome software installation on HPCF, possibly with a compilation of useful information in form of a “HPCF Users’guide for beginners”, oriented towards our NWP project. Météo-France can provide contact persons for the following items: script examples for producing IFS-to-Aladin coupling files (B. Chapnik), scripts for Arome on HPCF (Y. Seity), “AAA” library installation on HPCF (G. Beffrey, GCO). In addition, J.-M. Audoin can provide scripts for you to prepare Arome climatological files in advance on the VPP. TC may produce a more user-friendly script environment for all partners.
- PI and TC prepare a draft workplan, coordinated with all partners. An initial proposal is outlined below.
- PI and TC collect input from partners, in order to complete the annual report asked by ECMWF, to be submitted to SAC.

A specific “**Section Identifier**” has been defined for Morocco and Slovakia (“ca”). The Section Representative is Olda Spaniel. Retained postal addresses for the direct mails to these two countries are taken from the Aladin web page:

Morocco: Direction de la Météorologie Nationale  
Aéroport Casa-Anfa  
Casa-Oasis BP 8106  
20200 CASABLANCA, Maroc

Slovakia: Slovensky Hidrometeorologicky Ustav  
Jeseniova, 17  
P.O. Box 15  
83315 BRATISLAVA, Slovakia

**Initial connection** for “ca” specific section users (Morocco and Slovakia). The following steps have to be followed:

1. Météo-France receives the SecurID cards from ECMWF, and sends them to the users. The cards are then still not activated. Paper documentation from the Center is sent at the same time.
2. users receive by mail a declaration form for their SecurID card, which they need to sign and send back to Météo-France (C. Fischer), which forwards to the Center.
3. at a precise date, Dominique Lucas from ECMWF activates the cards for a given user, and the user needs to connect and update his pin passcode the very same day (this activation process only holds until midnight of the given date, therefore each user needs to indicate a date where he is indeed available for this action !). This is the final step for activation of the SecurID card.

Connection: please refer to the document “Introduction to computing facilities” under URL: [http://www.ecmwf.int/services/computing/help/new\\_user](http://www.ecmwf.int/services/computing/help/new_user)  
This document will also be provided in the paper documentation that each country will receive. The actual connection should be performed via Internet access, directly to the ECMWF gate:  
> telnet ecaccess.ecmwf.int

Here is a short description about SecurID card activation and connection to ECMWF, prepared by Marion Pithon:

“Please note that your SecurID card is initially disabled. This card will be enabled only when the "Declaration regarding ECMWF's SecurID card" form has been signed and returned to Météo-France.

The activation of the card (made by ECMWF) will remain enabled for less than 24 hours. At midnight it will automatically be disabled and will require re-enabling. Once the card has been activated, you can proceed to the first login :

First connect (via telnet or ssh) to ecaccess.ecmwf.int :

telnet ecaccess.ecmwf.int

...

login : aaa (your user identifier)

Passcode : XXXXXX(the ordinary cardcode displayed in your SECID card's LCD)

At first login enter the ordinary code displayed in your SecurID card's LCD at the passcode prompt. Once your cardcode is accepted you will be asked to choose a "Personal Identification Number ( PIN code)". The new-PIN prompt will appear :

Please enter the PIN :

Type in a 4 to 6 digits number of your choice (the first digit must not be 0). You will have to memorize it.

The verification prompt will appear :

Please verify the PIN :

Type in your PIN number again. If the system has accepted the PIN you will get :  
PIN accepted

and you are logged in .

The system is now aware of your chosen PIN and on subsequent logins you will use it on the card to generate the passcode. On subsequent logins, the passcode you will be asked for is obtained by entering your PIN into your SecurID card followed by the diamond (<>). The code generated by the card and displayed in the LCD now has this PIN embedded (hidden) in it and can be used (only once) as the passcode.”

**Monthly accounts** about the computational activity and resources will be provided by ECMWF/User support, via e-mail, to Claude Fischer (S.P. P.I.), Sandor Kertesz (TC) and Olda Spaniel (representative of “ca” identification section).

#### **Miscellaneous information :**

- COM HPCF: Use of supercomputing resources (6-10 March 2006, Reading). This is a 5-day module to introduce students to ECMWF’s supercomputing services. ECMWF has indicated that *a very limited number* of places are left open for this course. I would suggest those who are interested to check the program at:  
[http://www.ecmwf.int/services/computing/training/material/com\\_hpcf.html](http://www.ecmwf.int/services/computing/training/material/com_hpcf.html). Application forms should be handed over directly to ECMWF, but please inform me if you intend to apply (which supposes that you are free, and that you can finance the stay through your institute).
- A technical note by Stjepan Ivateks-Sahdan and Gergely Boloni, on the downloading of MARS archived IFS data, and their use as initial and lateral boundary conditions for Aladin runs (21-23/03/05). Available from the authors.
- IFS model outputs, especially historical GRIB files, will be available to the S.P. participants 24 hours in delay, with respect to validating time. Therefore, if you wish to run on a very recent case the coupling production, until say 48 or 54 hours, you will need to wait 3 days before being able to download the last (most recent) GRIB file from the IFS forecast.
- For users already having access to HPCF, and therefore belonging to other projects than “SPFRCOUP”, I do ask them to apply the following LoadLeveler directive before executing work related to the special project: #@ account\_no = spfrcoup. This will allow me to account precisely the volume of resources used inside the Special Project, and report it to ECMWF.
- New users will belong to the “aladin” and “spfrcoup” groups. Through “aladin”, they also belong (and have access to the resources of) “hirald”, where most of the model libraries are stored.

## Draft scientific workplan

I start recalling the major items of the proposed scientific and technical goals (excerpt from François' original proposal): "Traditionally, ALADIN and AROME have been coupled to large scale boundary conditions provided by the French ARPEGE global model. The purpose of this project is the investigation of the option to couple ALADIN and AROME to large scale model data, namely, the IFS operational archive and the ERA archives on MARS.

This project plans to explore the following questions:

- technical issues when coupling ALADIN/AROME to ECMWF model data: file preparation, data compression and telecommunication issues
- relative merits of coupling ALADIN/AROME to IFS vs ARPEGE models for NWP, using various geographical domains (the ARPEGE variable resolution grid is optimized for Southwestern Europe only, so using IFS output may be particularly interesting for more distant applications)
- impact of the large-scale model resolution on the quality of limited-area modelling
- desirable resolution and archiving policy of future reanalysis datasets for downscaling using ALADIN and/or AROME
- coupling issues linked to the representation of the surfaces
- coupling issues linked to the differences in physical packages, e.g. cloud physics
- optimisation of an intermediate coupling model for running at kilometric scales using AROME

Here, the intention is (1) to allow scientists from some selected (Cooperating and Non-Member) States access to resources on the HPCF, in order to perform boundary condition file preparation at ECMWF before sending it to their own sites for running the LAMs, and (2) to offer a unified software environment for preparing ALADIN and AROME boundary conditions to all interested States, for experimentation. The planned activites of this project are:

- 1.installation and maintenance of the ARPEGE/ALADIN scripts (IFS configurations 901/923) on the HPCF to convert IFS non real time model data on MARS into ALADIN/AROME coupling files
- 2.development and testing of new software to resolve model inconsistencies e.g. related to the surface initialization. An important aim of this project is to provide a unified, well-maintained environment for preparing LAM experiments.
- 3.preparation, by the Special Project participants, on the HPCF, and storage on ECFS of ALADIN/AROME coupling files for chosen test periods and geographical domains. This item is dimensioning for the Special Project, as it requires HPCF access for all listed participants, and some HPCF and storage resources.
- 4.local LAM experimentation to investigate model performance sensitivity to the coupling technique. Some LAM runs may be performed on the HPCF as well for testing purposes. This is where the scientific evaluation of the boundary condition quality will be performed."

From this text, I propose a draft workplan which consists in 4 rather successive steps (1-4), followed by more parallel items where participants can decide to be more active in one or another (5-9):

1. construction of a unified, "user-friendly" environment for coupling file production (first IFS operational stream, then ERA stream). Work by B.

Chapnik, G. Boloni and Stjep. I.-S. may be helpful. The goal is to propose scripts for all participants, with a minimum of technical documentation in form of a user's guide. Estimated manpower: 2-4 weeks. *Météo-France proposes to invite one person to Toulouse for two weeks*, in order to start up this item. *T.C. job ?*

2. installation of reference scripts on home user, and validation: 2 weeks/country.
3. assess telecom issue: size of transmission files. A local ee927 at home may be needed, just like for the usual Arpège/Aladin production. The local ee927 may also be useful for item 4 below. This item 3 is also linked with the optimization of coupling file size (a transversal topic in Aladin-2, without firm contours but some contacts: your P.I., Jean-Marc Audoin, Mariska). Estimated manpower (home effort): 2-3 weeks/country.
4. comparison of Arpège/Aladin versus IFS/Aladin forecasts, on case studies and possibly on a longer, statistical time scale. We would need results on 2, maybe 3, quite distinct geographical domains: Central European, Moroccan, (Atlantic ?). Through the efforts of several participants, we may have access to inter-comparisons between large and small domains (size above 2000 km versus size below 1500 km for instance). Estimated manpower (home effort): 1 month/country
5. impact of vertical resolution: test Aladin with a number of vertical grids, from Arpège to IFS discretization, taking advantage of the higher vertical resolution of the IFS (contact K. Yessad or P. Bénard to get the proper tool for setting the coefficients of the hybrid  $\eta$  levels)
6. usefulness and optimisation of an intermediate LAM for Arome
7. coupling issues linked with the surface:
  - a. initial spin-up due to the mixture of IFS near-ground (but altitude) fields with Arpège surface data (Ts, Ws, T2m, RH2m)
  - b. impact of different representations of major surface parameters: orography, land/sea mask, vegetation covers
  - c. Méso-NH has developed a specific surface field convertor from the Tessel scheme (ECMWF) to ISBA. The usage of this convertor for Arome may be investigated (the convertor presumably is available in Arome)
8. coupling issues linked with different physics: diagnostics like time series of domain-averaged precipitation, surface pressure, (other ideas welcome), should be checked in order to assess the impact of initial and lateral boundary conditions being "IFS-compliant", rather than "Aladin-native".
9. draw some guidelines for the archiving policy of re-analysis data for downscaling purposes: horizontal and vertical resolution, which surface fields; and coupling strategy for downscaling: intermediate models, physics compatibility.

As a personal wish, I suggest that participants do the effort to archive a selected set of graphs, pictures, and comments in text format about their results, in order to ease the annual reporting work to ECMWF SAC, and possibly to summarize the results in a more official publication. This effort would help the recognition of everybody's work.

I further recall that the Special Project is *not aimed at running long forecast experiments on HPCF* (rather producing big amounts of coupling files), and *even*

*less aims at running regular forecast experiments* (daily pseudo- operational models for instance, even over limited periods). Generally talking, *the exploitation of IFS products, or the coupling of a daily Aladin system for operational usage, are strictly prohibited*, as stated in the original demand submitted to the ECMWF Council.

Comments and possible commitments from participants are now welcome.