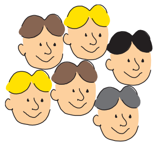
ALADIN and ALATNET News

1. A rainy summer

Weather was not very nice last summer, especially over Central and Eastern Europe which had to face very severe floods. ALADIN forecasts proved quite good in these circumstances. More details can be found in the dedicated paper from the Austrian team and in the LACE report.

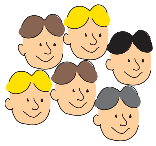
A dedicated SRNWP workshop was organized in De Bilt (Nl) on October 10th, after the annual joint EWGLAM/SRNWP meeting. Presentations and reports should be available soon on the SRNWP web site : *http://srnwp.cscs.ch/*.



2. LACE training course "on physics"

A training course on physical parameterisations was organized in Prague, from the 16th of September to the 4th of October. This was a pure LACE action, aiming at training a team likely to start research in physics within the new LACE structure. Students were few : Alexander Kann, Harald Seidl (Au), Martina Tudor (Cr), Martin Janousek, Richard Mladek, Petra Smolikova, Alena Trojakova, Filip Vana (Cz), Laszlo Kullmann (Hu), Martin Bellus (Sk), Kay Suselj (Si) (and not all expected to focus on physics afterwards, as one may guess).

The program was quite ambitious and training very intensive : general lessons about the NWP physics and special ones about the parameterisations used in ARPEGE/ALADIN, comparison between code and documentation, study and report on papers, work in small groups. For more details, contact *Filip.Vana@chmi.cz* or the teacher : *Jean-Francois.Geleyn@meteo.fr* .



3. "ALADIN maintenance and phasing training" workshop

Compared to the previous one, this training course was short, only one week (25-29 November) long, and more widely open (5 non-LACE students among 18). Considering the a-priori daunting topics concerned and the standing difficulty to find volunteers for phasing, it was a success : only 10 students were expected at first. The program was quite dense, with lectures, exercises and discussions. Details on the organization and presentations may be found on the dedicated web site :

http://omsz.met.hu/english/popsc/wshops/aladin_ws/prog.html (with a link from the ALADIN site)

This workshop also gave an opportunity to renew or write documentation on ALADIN. The final discussions are summarized hereafter, thanks to András Horányi.

Round table discussion
(ALADIN Maintenance Workshop, 2002 Budapest)

Source code management (validation)

- Use of *cc_depend*, *gmkpack*

Code has more and more dependencies. Use of sophisticated compilation and building tools is recommended. Possibilities:
- *gmkpack*'s (Météo-France) advantage is, that there is support for *ODB* as well.
- *cc_depend* (CHMI) is the other option, but it is currently does not handle *ODB*.

- *cc_depend* could be perhaps built in *gmkpack*.

⇒ Recommendation :

Developers outside Toulouse are encouraged to use *gmkpack*. The possibility to merge *cc_depend* and *gmkpack* should be explored.

- Source code management:

There will be more and more need to have local source code management due to local development and local operational applications.

⇒ Recommendation :

The usage of *CVS*. Export version of *CVSTUC* (a set of scripts making *CVS* more user friendly for ALADIN) will be created. For the package contact Martin Janousek.

<u>Xrd problems</u>

- *xrd* should be cleaned (useless routines to be removed etc.).
- duplication of *.c* and *.F* routines.
- All project (except *xrd*) can be compiled without explicit promotion of real and integer values.
- Problem of explicit declaration of arrays (memory consumption)

⇒ Conclusions :

Olda, Gabor, Martin, Stjep and Jure write a list of existing problems in *xrd* with a proposal of solutions. Olda starts the action. Jean-Daniel Gril will be the Météo-France contact person. It should be decided inside the above nominated group how to sort out problems and in which format to enter the modifications, after a possible (mandatory) check with ECMWF.

<u>Documentation</u>

- Users manual for configuration 001 would be very useful. There are some parts partially covered (i.e. non-hydrostatic) from scientific and architecture point of view.
- Technical/scientific documentation (with the structure similar to Alain Joly's paper) has to be written.

⇒ Conclusion :

Météo-France will invite a volunteer to Toulouse to set up the skeleton of documentation. Afterwards, the documentation will be completed and maintained with the help of experts for specific parts.

- Other proposal is improve self-documentation in the code (modules): short explanation of the module + description of module variables (easier to follow changes)
- Exercise for phasing: enhance explanations in modules

⇒ Conclusion :

Prototype namelists of all working configurations have to be added to export versions of new cycles with explanations in separate file or in the namelist itself.

<u>Coding rules</u>

- A great part of the work has been done with Ryad's documentation.
- Automatic checker for the code is needed.

⇒ Conclusions :

> Read and comment the coding rules and send the comments.
> Météo-France will discuss the usage of coding rules with ECMWF.
> Coding rules are obligatory while working on the ALADIN code.
> Coding rules are recommended while working on external tools related to ALADIN.
> Concerning the automatic checker, it could be the supplementary part of new *fortran2html* parser.

Future code evolution

- Further externalization, modularization (as TFL/TAL)

goal :	step by step towards more rationalized and modular code.
proposals :	biperiodization, coupling?, FullPos...
question :	how to handle the interfaces to modular part?

- Parallel I/O: follow the evolvement of implementation of MPI-2, but no concrete actions for the time being.
- Revision of data flow (not decided yet who and how it is going to do the job)
- Reformulation of physics/dynamics interface

Phasing (validation) strategy

- Number of phasers is limited, on the other hand the number of configurations has increased and they have to be phased rather sequentially than in parallel

⇒ The spirit of phasing has slightly changed :

> rather continuous than a "one go" procedure
> the job has been split to direct code phasing followed by the phasing of data assimilation parts (a core-group works on the basic configurations and the rest is phased afterwards)

⇒ Further proposals :

> Some parts of the phasing could be exported.
> Training of newcomer phasers (this workshop was a proper introduction).

Export version

- Some additional information to be attached to export versions:

> prototype namelists
> specific document about validated configurations

- Incremental strategy for export versions was proposed which means:

> a basic export version (at least 927, 001, Full-Pos)
> bugfixes for other working configurations (bugfixes with respect to the basic version)

- LACE ASC (Olda) will be responsible to report the platform-specific modifications of the code with respect to the reference version in Météo-France and other local specific issues.

ODB

- Generic problem is the lack of documentation:

- installation guide would be very useful
- validation guide/doc.   - " -
Both have to evolve with modifications cycle by cycle...

- It was decided that the LACE Data Manager (Stjep) will take over the coordination of the *ODB* related work, to start with the writing of an installation guide.
- It is planned that possibly Sandor + Stjep will work together on next cycle's installation in Budapest.

Web server

- Recommendation: Visit to Météo-France has to be organized to maintain the web server.
- Mirroring between intranet and internet part of ALADIN web server.

AOB

- Next workshop about maintenance in 2004, decision at the next ALADIN Assembly of Partners
- Format has to change perhaps to the lectures in the morning and exercises in the afternoon.
- Undiscussed topics : Optimization, E923

4. EWGLAM and SRNWP events

a. Annual 2002 EWGLAM and SRNWP meetings + SRNWP workshop on floods

De Bilt (Nl), 7-10 October 2002
The corresponding LAM Newsletter and some pictures are already available at : *http://www.knmi.nl/hirlam/EWGLAM2002/* , thanks to the efficiency of Gerard Cats.

b. HIRLAM workshop on Mesoscale Modelling

Dublin (Ir), 14-16 October 2002
Dijana Klaric was the ALADIN representative at this workshop. For more details, contact her or have a look at the HIRLAM web site. The proceedings are also available in Toulouse.

c. SRNWP workshop on Numerical Technics

Toulouse (Fr), 12-13 December 2002

The corresponding report should be available soon on the SRNWP web site (updated recently) : *http://srnwp.cscs.ch/*

d. SRNWP workshop on Statistical and Dynamical Adaptation

Vienna (Au), 5-7 May **2003**
"The scope of these meetings has been enlarged : not only the statistical adaptation will be the topic of the meeting, but also the dynamical adaptation. This includes presentations on, as examples : 1d models, road condition models, trajectories, orographic precipitation models, down-scaling methods, etc ... " (extracted from the official announcement). More details on the dedicated site :
http://www.zamg.ac.at/swsa2003/

e. Annual 2003 EWGLAM and SRNWP meetings

Lisbon (Pt), 6-9 October **2003**
The scientific topic will be : Use of new data for short-range NWP.

f. SRNWP workshop on High Resolution Modelling

Bad Orb (De), 27-29 October **2003**
with special emphasis on physical parameterizations.

g. SRNWP workshop on Verification Methods

De Bilt (NL), autumn **2003** ?
focussing on precipitations.

h. A new SRNWP Lead Centre

HMS, as a member of the ALADIN group, volunteered to be the new Lead Centre for LAM EPS, but there are 3 candidacies ...

i. SRNWP report for 2002

The annual SRNWP report, written by Jean Quiby, may be found hereafter. It should be available soon on the SRNWP web site.

EUMETNET
C-SRNWP Programme

Annual Report 2002

Workshops

The workshop activity has followed the rule that each Lead Centre has to organise a workshop every two years. With one exception, all the workshops of the even years have take place, the exception being the UKMO which, because of the move of its headquarters from Bracknell to Exeter, has postponed its 2002 workshop on Variational Methods.

Workshop on LAM-EPS
At the initiative of the INM (Spain) and in cooperation with it, the first workshop in Europe on EPS (Ensemble Prediction Systems) for LAM (Limited Area Models) has been organised in Madrid the 3-4 October. The motivation was the following: the EPS technique is successful for the medium-range and there is no scientific reasons hindering the use of this technique for the short-range. That the technique will be more delicate to apply at short range due to a smaller spread between the members is to be expected.

Workshop on Numerical Techniques

Following the decision taken at the SRNWP Annual Meeting 2001, the Numerical Technique Workshop moved from the odd to the even years and took place at Meteo-France Headquarters the 12-13 December. This workshop was again very interesting and experiences amplification: numerical problems more specific to the climate GCM were also discussed, as the conservation of mass in the lagrangian advection. This problem is not of primary importance for the short-range, but is a preoccupation for the climate simulations. Concerning our high resolution LAM's, a problem is emerging that will become very important with the steadily increase of the horizontal resolution: to have numeric schemes that can cope with very steep slopes.

<u>Workshop on the August floods in Central Europe</u>
With the full support of KNMI, the Coordinator organized a one day workshop (10 October) on the August floods that caused large-scale damages in Austria, in the Czech Republic and in Germany. That workshop took place immediately after the SRNWP Annual Meeting. The purpose of this workshop was to see how our models have coped with the huge amount of precipitations measured on the 12th and 13th of August. The workshop has been very successful in the sense that not only the affected countries or their neighbours presented their precipitation forecasts, but also more distant countries like UKMO, Spain or Ireland. The presentations were followed by a general discussion where the impression given by the presentations has been confirmed: it was only for 24h in advance that our LAM's gave the right amount of precipitations at the right place. It is not known why most models put the precipitations systematically too far to the East. Many participants shared the opinion that the source of this inaccuracy must lie in the boundary conditions yielded by the global models. It has also been said that the usefulness of the ECMWF EPS has been very limited.

EU projects

The Coordinator has been deeply involved in two projects:

<u>ALATNET</u>
The Coordinator has been asked by the Commission to act as expert advisor for the mid-term review of the ALATNET Project (22-23 April, Brussels). This Project which permits to 12 young scientists to be trained as PhD candidates or as Post-Doc's in numerical and dynamical meteorology using the structure and the support of the ALADIN/LACE Consortia is a very good promotion for the NWP science in Europe. The Coordinator has been impressed by the large scientific scope covered in this project and by the quality of the works presented.

<u>Framework Programme 6</u>
In May, the Coordinator has proposed to the SRNWP Members to submit an EoI (Expression of Interest). The answer has been very positive. With the help of colleagues of 4 NWS, he has drawn up and submitted a proposal for a "Network of Excellence", this network being the NWS of our 5 Consortia. The title of the proposal was: "Improvement of Weather Forecasting and Risk Assessment in Europe by Very High Resolution Simulations, Ensemble Forecasting and Modelling System Developments".

Annual Meeting

It took place in the Headquarters of the Dutch NWS in De Bilt (9-10 October). 23 European NWS were represented (which is remarkable) plus the ECMWF. The main points of discussion have been:

<u>EUMETSAT ATOVS Retransmission Service</u>
Several NWS have been pleased to hear that with the new station Athens the South and South-East of Europe will also be covered by this Retransmission Service. The Coordinator has expressed to the EUMETNET Deputy Director his thanks for the fulfilment of his request (cf. Annual Report 2001).
<u>Hourly SYNOP's</u>

With the continuous data assimilation schemes (as 4D-Var or nudging) and for the validation of the model diurnal cycle, it becomes each year more important to have SYNOP's on an hourly basis. The Coordinator showed, as example, the SYNOP chart of the 25 Jan. 2002 at 11h00 UTC. The discrepancy is maximum : either is a country covered with SYNOP (as for example Portugal, France, Ireland, United Kingdom, Germany, Belgium, The Netherlands, Austria) or the country is void of any observation (as, for example, Switzerland, Italy, Spain, Denmark, Sweden, Norway, Finland, Island, Greece). The Coordinator will try in 2003 to find out the reason of this dichotomy.

<u>LC for LAM-EPS</u>

After the success of the Madrid Workshop (see above under Workshops), the Assembly has decided to create a new Lead Centre for LAM-EPS. SRNWP Members have had the possibility to apply till the end of the year to become this new Lead Centre. Four NWS have applied.

<u>Hourly frames from ECMWF</u>

Switzerland reiterated his wish to receive from ECMWF the frames for each forecast hour (+00, +01, +02, etc) instead of the 3-hourly frames (+00, +03, +06, etc) as today. But no other country supported this requirement.

<u>SRNWP Multi-Model Ensemble</u>

All the EPS works done today in Europe and presented in Madrid last October are single-model EPS. DWD volunteered to assess the feasibility of the multi-model LAM-EPS. We have in Europe four models : HIRLAM, ALADIN, Local Model and UKMO UM. These models will form the basis of the multimodel short-range EPS. This work will be established in 2003. In order to avoid administrative difficulties, these multi-model ensemble forecasts will be computed in a first step in delayed mode, i.e. with a delay of one or two days. Surface pressure, wind at 10m and precipitations at +48 will be produced one a day.

<u>FP6</u>

At the time of the Annual Meeting, the situation was not very clear what FP6 would be. Nevertheless it was thought that SRNWP should follow its intention expressed in its EoI: to propose a Network of Excellence and not an Integrated Project.

EUMETSAT SAF's

Some of the developments made in the Satellite Application Facilities (SAF) centres are of great importance for the NWP. It was always accepted - as far as NWP is concerned - that the benefit of these developments goes mainly to the global models. It must today be realised that the benefits could be of the same importance for the high-resolution LAM's that it is for the global models.

<u>SAF on Land Surface Analysis: 8-10 July 2002. Lisbon</u>

As the soil processes are of the utmost importance as forcing for the boundary layer and more generally for the hydrological cycle (cloudiness included), it has been judged important to attend this workshop also because the LAM community was weakly represented next to the ECMWF.

The coordinator has brought successfully three amendments to the final recommendations which should be positive for the short-range NWP community:

- Snow cover: to concentrate to the simple method (the so-called spectral one) in order to have products as soon as possible and to have the more complicated method (the directional one) as a second step.
- Resolution of the albedo maps: as albedo is a function of vegetation, same high resolution for the vegetation as for albedo (and not a coarser one as envisaged).
- In the priority list: to give to the snow cover a higher priority than to the land surface temperature.

For the report:

J. Quiby
C-SRNWP Programme Manager

5. ALADIN cooperation

a. 7th Assembly of Partners

The 7th assembly of ALADIN partners was held in Bucharest, Romania, on the 28th of October, 2002. It welcomed participants from 14 ALADIN countries and an ECMWF observer.

The minutes should be soon available, but some points may already be mentioned :

- agreement concerning the use of the ALADIN model in climate mode for scientific purposes (climate simulations), by the International Arctic Research Center (IARC) of the University of Alaska in Fairbanks, Alaska (USA);
- agreement on the cooperation with African countries, with Morocco as main intermediate (see hereafter);
- problems with ODB (lack of documentation and support) underlined once more;
- idem for the subcritical size of some ALADIN teams, the need for more publications and documentation, etc;
- presentation by Jure Jerman of the "Prototype for common objective verification at synoptic scales". No agreement was found on the problems of financial and technical support to the Slovenian team, so it was suggested to continue the prototype development and present both the results and a detailed documentation including the foreseen economical efforts next time;
- presentation of some opportunities within the 6th Framework Program of the European Union;
- creation of a "rotating foreign bureau" hosted by the last organizer of the Assembly of Partners, starting with Romania. This committee will monitor the MoU modifications required by the cooperation of the ALADIN Consortium with ACMAD (see hereafter);
- no volunteer to host the next ALADIN workshop.

Next meetings : Cracow, end of October 2003; Croatia in 2004.

b. Cooperation with African countries

Following the conclusions of the working group's meeting in Ston-Dubrovnik (Croatia - 04.2002) and of the WMO meeting in Pretoria (RSA - 10.2002), and within the cooperation between ACMAD and Météo-France on one hand and between ACMAD and DMN Morocco on the second hand, to develop NWP in Africa, a new configuration of ALADIN, called ALADIN-NORAF, is running operationally in Casablanca since the 24th of February. The NWP products issued from this new model should be sent to the covered NMSs via RETIM 2000 or Internet. The final agreement is for the following list of African countries : Algeria, Benin, Burkina-Faso, Chad, Egypt, Eritrea, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Liberia, Libya, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra-Leone, Sudan, Togo (Morocco and Tunisia being full ALADIN members).

The ALADIN-NORAF domain covers nearly all the African countries to the north of the equator (from 43.86°N to 0.70°S and from 36.20°W to 56.48°E). This model is run twice a day, at 00 and 12 h UTC, with respectively 72h and 60h forecasts. Data assimilation is realized every 6 hours, using optimal interpolation in a first step. By the end of this year Morocco plans to use raw radiances from TOVS AMSU-A with a 3d-var implementation. The coupling files are provided by Météo-France from the ARPEGE stretched global model. In parallel a local model ALADIN-ALBACHIR, covering Morocco, is run without data assimilation and coupled with the regional model ALADIN-NORAF.

A new users' group, the Committee of Users of the Model ALADIN-NORAF (CUMAN), has been created by ACMAD to define the best products which should be produced and distributed to the NMSs, and to discuss on the different topics linked to the exploitation of this new model. The first meeting of the CUMAN will be held in Casablanca by the end of April.

For more details contact Radi Ajjaji in Casablanca or Philippe Caille in Toulouse.

c. Scientific reports

Thanks to the thematic coordinators, a detailed scientific report covering the first 10 months of 2002 (prepared for the Assembly of Partners) is available on the ALADIN web site :

http://www.cnrm.meteo.fr/aladin/scientific/2002/rapport_long_2002.html

Many other documents are now available on these pages. A scientific plan for ALADIN in 2003 has not been prepared yet, because of the uncertainties resulting from the problematic relationships between ALADIN and AROME (see below).

d. New LACE organization

The organization of the LACE group (including Austria, Czech Republic, Croatia, Hungary, Slovakia and Slovenia) has been modified. From the beginning of 2003, the common operational LACE suite stops. Each partner is responsible for its own operational applications, only the coupling files computed from ARPEGE are the same for all domains. Hence several teams were very busy with the design of new operational domains along the last months. Cooperation remains in research (3 working groups), training (next topic : ODB) and maintenance actions.

The new team of coordinators is the following :

- project leader : Dijana Klaric
- dynamics and coupling : Petra Smolikova
- data assimilation : Gergö Bölöni

- physics : Thomas Haiden
- maintenance : Oldrich Spaniel
- data management : Stjepan Ivatek-Sahdan

e. Next ALADIN workshop ?

Though the problem was raised again and again, no partner volunteered to organize the 2003 ALADIN workshop till the end of February ! Since the Newsletter is late (as often), we are glad to announce that the Czech team offers to welcome the next workshop in Prague, during the last week of November. More details soon.

Austria candidated for 2004.

f. ALADIN and AROME ☺ ? ☹ ?

AROME is a Météo-France project aiming to design a NWP LAM of very high resolution (2-3 km) within 2010, "as far as possible in cooperation with ALADIN partners".

However, though the ALADIN non-hydrostatic dynamics (and the ALADIN source code) was chosen as the starting point for AROME, a future cooperation may really be questioned. The following report, issued from CSSI discussions, was sent to Directors and a dedicated scientific+political workshop will be organized in Prague (11-12 April), just before the next WMO session.

Report from the CIPN (Comité Informel sur la Prévision Numérique) ad-hoc working group meeting

Météo-France, 5 February 2003

by Radmila Brozkova and Luc Gerard, members of the Group of Coordinators for Scientific and Strategic Issues (CSSI) established by the ALADIN Assembly of Partners

In short:

In the context of the introduction of the new AROME project, a new willingness to merge gradually and as far as possible the different modelling projects (ARPEGE-CLIMAT, ARPEGE-ALADIN and Meso-NH), has arisen at Météo-France.

The idea is to maintain only two branches, namely the global applications and the very high resolution applications (note that the present ALADIN model sits midway between these two branches).

This translates in the following actions:

1) The ARPEGE model remains with its 1D physics the basic global model, providing lateral boundary conditions to the Limited Area Models.

2) Convergence must be searched between ARPEGE-CLIMAT and ARPEGE-NWP (ALADIN) Physics; a new physics-dynamics interface will be realized in concertation with the ECMWF.

3) The AROME model (intended for meshes below 3 km) will use the non hydrostatic ARPEGE-ALADIN dynamics and possibly its data assimilation (this shall be further discussed), together with the Meso-NH (3D) high resolution physics.

A simpler version of the AROME physics will be developed for meshes around 10 km, but remaining still computationally significantly more expensive than the recent ARPEGE-ALADIN physics.

4) Since AROME could be for a long time out of computer capacity for many ALADIN countries but also for specific applications, the interest of the ALADIN physics at high resolution remains, and particularly the developments intended to mesh sizes between 7 and 3 km. These resolutions require specific refinements in the physics, particularly for the convective processes whose scales are partly resolved by the model grid.

Météo-France prefers to focus on AROME-3km and *it is a challenge for the ALADIN community to carry out research and its applications (in a continued ARPEGE-type phasing context) for these intermediate resolutions.*

A sensibilisation and discussion workshop is planned on 11 and 12 April 2003 in Prague.

1) Introduction

Following the decisions made by CIPN in December 2002, a meeting of the so-called ad-hoc enlarged working group of CIPN was scheduled for the end of January 2003. The main goal of this meeting was to review the work accomplished by the CNRM teams to respond to the strategy decided last December and to discuss with Météo-France Directors an analysis of the ALADIN and AROME convergence and a proposal on how to proceed. The agenda contained still some smaller items, like information on the recent parallel suite results, information and demands from forecasters etc., as well as a technical part on the interfacing of the mesoscale physics. The meeting was attended by the Director for Strategical Issues (over phone from Paris), head of CNRM, head of the NWP unit (GMAP), head of the climate unit (GMGEC), head of the mesoscale modelling unit (GMME), chief of AROME, key experts from the above mentioned units, representatives of the forecasting division and two members of CSSI invited from outside. There were two major items concerning ALADIN in the agenda, both linked to the model physics, which are reported here below.

2) Perspective of the convergence of ARPEGE-NWP and ARPEGE-CLIMAT physics

The physics of ARPEGE-CLIMAT has gradually drifted away from the operational ARPEGE physics, corresponding to new specific needs for the climate. This resulted in various switches deciding to call different parameterizations following the kind of run being performed.

To limit double work or perpetual overhead and delays in cycling, but also in regard to the limited impact of "screwdriver tunings" in the NWP model, it was decided that a convergence of both models should be searched in a reasonable time.

The advantage of the convergence of the two models would be first a neater code, easier to understand and to handle. The operational constraints of NWP can be quite different from those of Climate runs, but it will now translate mainly in differences in use, which should all be clearly justified, while the code should satisfy the two uses without acrobatics.

We could summarize the differences as next:

- The use of the Fouquart-Morcrette radiation scheme in CLIMAT, which is an accurate scheme called every 3 hours, opposed to the simplified radiation scheme of `ACRANEB`, much quicker to compute and called every time step.
- For the climate model, additional parameterisations of ozone, different kinds of aerosols give an important input to the radiation scheme, while they have no impact in NWP.
- The surface and vegetation scheme ISBA from CLIMAT has successfully been applied in the NWP applications, where it uses only one layer below the surface instead of three.
- ARPEGE-CLIMAT has used a diagnostic Turbulent Kinetic Energy scheme (TKE, Mellor and Yamada) for several years, and now a prognostic TKE scheme has been developed. The goal was to get a better representation of the diurnal cycle in the model. The TKE field is not

advected and doing it would not be easy since the variable was coded on the half levels of the model. The NWP model still uses a classical Monin Obukhov approach, while only preliminary work has been achieved for a TKE scheme at full levels.

- Stratiform cloudiness and precipitation are handled differently in the two models, the present diagnostic scheme of the NWP is very crude. This is in close relation to the developments in microphysics (next point).
- Work has been performed in both teams about the representation of cloud water.
  a) In ARPEGE-CLIMAT, the scheme developed by Ph. Lopez has been successfully tested.
  b) Parallelly in the frame of ALADIN some tests have been performed on a slightly modified adapted version of Lopez's scheme (keeping a separation of ice and liquid phases)
- New CAPE and mass flux-based shallow convection parameterisations have been tested in ARPEGE-CLIMAT
- The diagnostic convection scheme is still common to both models, but for the NWP, important developments have been started on a prognostic convection scheme, addressing cloud water and that should also solve the conflicts between subgrid and resolved precipitation at high resolutions.
- ARPEGE-CLIMAT also uses a scheme for the convective drag, which is represented the same way as the orographic gravity wave drag.

On many topics, the convergence between the two models seems feasible in reasonable time, with still some unavoidable specificities for the different operational constraints.

The following actions are proposed:

- For the radiation, the Fouquart-Morcrette has been tested in NWP, tests of a call at each time step is also planned. But this stays too heavy for NWP, so the possibility of an intermediate complexity scheme is still investigated.
- For the surface scheme, the convergence is practically realized. Some enhancements have been achieved in the NWP context, as the introduction of surface ice.
- A prognostic TKE scheme with continuity at the surface and large scale advection (requiring that TKE be defined at full levels) is the best choice.
- The cloud water scheme from Lopez seems a good choice, as its adaptation with a separate advection of ice and liquid has succeeded, and current developments around deep convection for NWP are compatible with this scheme. (The NWP should probably be able not to call the prognostic option for the precipitation itself.)
- The precipitating convection parameterisation is presently under important developments. It will benefit of the work performed in both contexts, and going to a more prognostic closure condition, associated to the moist TKE scheme, could help to solve together the shallow and deep convection.
- For the mountain drag, the NWP will suppress the use of the envelope orography, and one will assess the behaviour of the convective drag in the same frame (the code is identical). Common work will search the better equilibrium between gravity wave drag, form drag, lift and convective drag.

3) Problem of the AROME vs ALADIN physics

Chief of the AROME project prepared an analysis of the problem on the AROME/ALADIN convergence together with proposals on possible solutions, as he was charged by CIPN. This document is of a restricted distribution and it was submitted to the Météo-France Directors and summed-up at the meeting. The general problematics of the AROME and ALADIN convergence was discussed shortly, and it appeared that the Director was satisfied with the analysis. Then CSSI members were invited to express the needs of ALADIN Partners and their point of view. They stated that the reactions on the ALADIN side to the CIPN decision are very few for the time being and the main reason is probably a lack of proper information in order to get the right picture of the practical aspects of the policy decided by CIPN. The Director then concluded that a workshop ought to be organised with the ALADIN scientists and ALADIN Partners representatives. The head of GMAP was put in charge of the organisation of this workshop.

Then, within a short discussion it was re-confirmed that the most difficult item of the AROME and ALADIN convergence is the model physics. While for the dynamics and data assimilation it can be considered that these are de-facto joint and that the research and development work in these domains made in ALADIN shall contribute directly to AROME and vice versa, the best solution on the strategy for the development of an ALADIN-type physics is difficult to be found.

To sum up, the problem for a follow-on of the present ALADIN strategy lies in the requirements below:

- The need for a parametrization of convection suited for the 7-3 km scales, which is a tough challenge;
- The need for parameterization schemes which should by their philosophy and quality approach those of AROME but be closer to ARPEGE for their cost. This seems to be an issue difficult to solve but a crucial one for ALADIN Partners;
- It was proposed to start by testing the Meso-NH parameterizations in the ARPEGE/ALADIN 1D model first and when successful to proceed to 3D model (and to add the 3D turbulence only later) while keeping the 1D-type interface in AROME compatible with the present interfacing practice of ALADIN. This action responds to a need of AROME but also to most of the interface question for ALADIN 7-3 km semi-cheap physics;
- However the existence of this semi-cheap physics will have to be ensured by developers from the ALADIN Partners of Météo-France. It should be well understood that the 1D lower resolution AROME physics is meant for about 10 km scales, that it will be about twice more expensive than our current ARPEGE-like 10 km physics and that it still does not solve the moist convection problem of 7-3 km scales;
- The need for the maintenance of the physics specific to ALADIN (see above) and, in very specific cases, of its interface;
- The need for an anyhow increased maintenance effort when both ALADIN and AROME physics will coexists in some code.

At the same time there are already first steps made to cope with the requirements of the AROME's physics interface, like how to solve the organisation of the time-step, how to introduce new necessary variables, how to access 1D versions of the schemes.

The first outline of the time-step with 3D AROME physics may be described as follows:

a) inverse spectral transforms;
b) adaptation step of the physics;
c) evolution step of the physics depending on the previous adaptation;
d) preparation of the dynamical source terms;
e) addition of the tendencies of the steps b) and c) to the prognostic variables in the semi-Lagrangian interpolation buffers (to obtain these quantities at the origin point of the trajectory by sometimes monotonous- interpolations);
f) 3D minus 1D computations needing local information, processed within the semi-Lagrangian halo at the same part of the code when the interpolations are made;
g) semi-Lagrangian advection;
h) second adaptation step of the physics;

i) rest of the dynamical computations and direct spectral transforms;
j) spectral semi-implicit solver and possibly other spectral computations.

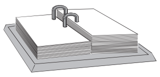
Compared to the current organisation of the model time-step a reader can easily imagine what would mean the interfacing of the AROME 2.5 km physics. One part of these computations will be iterated in the predictor-corrector schemes (from the step d) to the step j)).

For the introduction of new variables needed for the AROME physics, an analysis was already made together with ECMWF and there will be new data flow structure, treating via F90 descriptors the various attributes of model variables (spectral or gridpoint, needing derivatives or not, being advected or not, being coupled or not and so on) in a single framework (except for the big six variables part of the semi-implicit scheme for which the current structure will remain unchanged). After handling the attributes at the level of the setup, the data flow will become transparent to the user and the addition of a new variable will become far more easier. In a first step this will apply only to upperair variables of KLEV vertical extension. As a first consequence, model will have to use as a spectral variable the quantity *RT* instead of *T* (a first challenge for the ARPEGE/ALADIN community). The major rewriting of the code will take place in late spring early summer and new library is hoped to be available in late summer (preliminary component of cycle 27).

4) Conclusions

The important point of the meeting was the decision to organise an ALADIN-AROME workshop in order to explain well the new practical and political issues of the convergence of the two models. At the same time it remains clear that this convergence will bring important benefits to both sides but also has some potential drawbacks for small or medium computing resources, if some appropriate reorganization of efforts are not taken-on in parallel by the ALADIN Partners of Météo-France.

6. ALATNET events



a. Timetable of stays

The ALATNET stays of Christopher Smith in Prague, Ilian Gospodinov in Bruxelles, Cornel Soci and Gianpaolo Balsamo in Toulouse are now finished. Cornel and Gianpaolo should defend their PhD thesis before the end of Spring 2003.

b. Workshop on coupling

A one-week (17-21 February 2003) workshop on coupling issues has been organized by the Slovenian team in Ljubljana. The program is available at the following address :

http://www.rzs-hm.si/alatnetseminar/mcw.html

c. Reports

The next annual report must be sent before the end of April. A meeting of the steering committee is scheduled on the 24th of March in Ljubljana.

More informations are now available on the personal web pages of the ALATNET students.

d. Last workshop

A workshop gathering ALATNET students, their mentors and an additional member of each ALATNET team will be organized by the Hungarian team from the 15th to the 17th of October 2003. The SRNWP coordinators and representatives of the other consortia are also invited.

This meeting was scheduled after a demand from the EU representative, Mrs Jane Shield, at the mid-term review. Its aim is to allow students to present their results and discuss together once again. Part of the workshop will also be devoted to the preparation of the final review.

e. And afterwards ?

A proposal for a new RTN in the framework of the 6th FP of the EU (second call, November 2003) is to be considered. When compared to ALATNET, the network should focus more on training and involve more European countries. Along informal discussions during the EWGLAM meeting, COSMO expressed some interest in a joint venture.

7. Some practical informations

a. About 2003 stays

In Toulouse :

Many visitors are expected in Toulouse in 2003 !

Embassy fundings for Central and Eastern Europe asked for 2002 are now available, while in the meantime maintenance fundings slightly increased and the department of international affairs of Météo-France (D2I/INT) obtained extra fundings for ALADIN (both as a counterpart to the disappearance of Embassy fundings). Embassy fundings for Morocco and Tunisia will be negotiated soon, and are likely to keep the same level as last year, at least. And ALATNET stays are to be added.

However the situation is quite messy. The management of fundings depends on their origin, let us recall the rules :

Type of fundings	MF- maintenance	Embassy "CEE"	Embassy "Mo-Tu"	MF - D2I/INT
Responsibility	GMAP	D2I/INT+partner	D2I/INT+partner	D2I/INT
Contact points : organization official papers practical details	 Dominique Giard Jean Maziejewski Jean Maziejewski	 Dominique Giard Sylvie Rivals Jean Maziejewski	 Dominique Giard Sylvie Rivals Jean Maziejewski	 Dominique Giard Sylvie Rivals Jean Maziejewski
Travel paid by	Météo-France	partner	partner	partner
Per-diem paid by	EGIDE/Toulouse	EGIDE/Paris	SMF	SMF
Number and length of stays	≤ 25 ≤ 40 months	8 13 months	9 ? 16 months ?	≤ 4 ~ 6 months

All stays should start before the end of 2003, but EGIDE/Paris is not yet ready, and there are now few offices available at GMAP for visitors. If we don’t obtain some more (the demand is already a few years old) we won’t be able to welcome everyone. Small (very small) indices that discussions might start soon appeared along the last weeks.

The timetables are available on the ALADIN web site.

In Budapest :

A grant for a stay in Budapest is offered by HMS, as in 2002. Here is the official proposal :

The Hungarian Meteorological Service offers on its own expenses a 2-4 month research stay in Budapest for 2003 : we would provide 1400 euros as monthly allowance and possibility for a cheap accommodation at the guest room of our Service (the travel costs and the social insurance is on the responsibility of the candidate). Working conditions : PC or X-terminal accessing our IBM Regatta server, last ALADIN code version, *totalview* debugger available.

The proposed topics are as follows:

Further optimisation (parallelisation) of the ALADIN code : Work had been already started on the B-level parallelisation of the ALADIN code together with the implementation of the LSPLIT option. The enhancement of these features together with the tests using *OpenMp* parallelisation are the main objectives of this work.

First experiments on LAM EPS : At the beginning of the year some plans were formalised in order to start the LAM EPS (limited area ensemble) experiments for the ALADIN model. The first investigations will concentrate on the application of ARPEGE EPS information as initial and lateral boundary conditions for the limited area run. It is expected that first LAM EPS runs are going to be performed and evaluated.

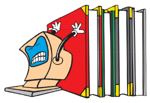
Data assimilation : The ALADIN 3d-var data assimilation scheme is quasi-operationally running at the Hungarian Meteorological Service. The proposed work would concentrate on the extension of the 3d-var scheme towards four-dimension with the implementation of the 3d-fgat procedure, which allows the consideration of the observations at the exact observed time together with the first guess information at the appropriate time.

For the interested candidates, experience in running ALADIN and sufficient scientific background are desirable. In case of interest potential candidates should contact András Horányi (*horanyi.a@met.hu*) for further details.

Deadline for applications is 31st of March, 2003, the candidates will be informed about the decision until mid-April.

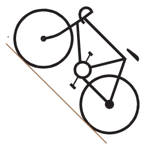
LACE actions :

Fundings are available within LACE for research stays : 8 months (4 for dynamics, 3 for data assimilation, 1 for physics), in Budapest (1), Prague (6) and Vienna (1).



b. Documentation and publications

A significant effort was dedicated to documentation along the last months, thanks to the workshop on maintenance. The corresponding information is available on the (internal) GMAP web site and on the ALADIN pages, referring to the HMS web ones. This will be pursued along 2003, with some reports already scheduled : general ALADIN documentation (update by Jan Masek), 923, DFI,... PhDs and publications will also be considered (and in practice are restarting). Several maintenance stays in Toulouse have been scheduled for such a work. The next step should be an update of the ALADIN and ALATNET web sites, to take this into account. Any volunteer ?



c. New cycles and export versions

• ***Export version for cycle 25T1*** *(AL25T1_export_01)*

A new export version, based on cycle 25T1, has been prepared recently. Apart from the reference version, whose main advances have been described by Claude Fischer in the previous Newsletter, it includes further debugging, especially in data assimilation configurations, and the latest changes for operations in Toulouse (in 2002). A short description of changes and the source code of convertors (for geometry and namelists) are available in the export package.

This cycle has been implemented operationally in Toulouse (17 December), and the change of geometry within coupling files was quite smooth. It has also been installed in Slovakia, for research on NH dynamics mainly, and in Morocco, for operations.

Let us briefly recall the contents of this version :
- a lot of pruning (removing unused options etc), cleaning, debugging (as usual), and more safety locks, especially in physics;
- new ALADIN geometry (and induced changes);
- implementation of a "unified" predictor-corrector time-stepping scheme;
- introduction of the source code for blending;
- update of data assimilation configurations, new management of satellite data, small changes in ODB (but with no ascending compatibility), improved use of land-sea mask in some "surface" observation operators;
- use of local climatological ozone profiles in radiation (on demand), changes in the anti-fibrillation scheme;
- update of options `LVERCOR` (relaxation of thin layer hypothesis) and `LVERTFE` (finite elements for vertical discretisation) in dynamics;
- refinements for the vertical-plane model, with still some problems;
- and pure ARPEGE modifications.

• ***Cycle 25T2***

A new cycle was created last autumn, including:
- new developments in NH dynamics : new prognostic variable *d4*, predictor-corrector scheme, new sponge, advection of vertical velocity, corrections in the vertical-plane model ... (this was the main purpose of this intermediate cycle);
- tendency-coupling for surface pressure (only for 2TL schemes and standard DFI);
- 4d-screening in ALADIN;
- introduction of an "obs pre-processing" for ALADIN : geographical selection of observations, in C+I zone;
- improved handling of "mean wind" in variational applications;
- use of raw radiances in ALADIN;
- improvements in the selection of surface observations (case of isles and lakes, use of SYNOPs with missing height information);
- merge of the new snow scheme (described in the previous Newsletter), safer handling of liquid water and ice in physics;
- optimizations, cleaning, and pure ARPEGE modifications.

There is no corresponding export version.

• ***And***

Modifications for configuration *923*, based on the export versions *AL12_export_04* and *AL15_export_03,* are available. They allow, first to run *e923* on AL15, second to solve some standing problems and use new developments. A documentation has been sent to the e-mail list *aladin@meteo.fr*.

A new export version for AL15 should be prepared soon, including the bugfix for *923* and new developments in physics, at least.

A new export version for AL25T1 will also be prepared, for changes in physics.

For more details, contact Claude Fischer : *claude.fischer@meteo.fr*, or the GCO team (with a newcomer !) : *gco@meteo.fr* .

d. ODB

Complains about ODB (lack of support and documentation, very quick evolution,...) were many and strong along the last "official" meetings. We got an answer from ECMWF : they listen but cannot provide a documentation before Spring 2003. In practice the most recent news are : (***i***) ECMWF asked for the documentation written by Dominique Puech (GMAP), to translate it; (***ii***) Databases must be rebuilt at each new cycle.

e. New e-mail addresses in Romania

The new ones read : *forename.name@meteo.inmh.ro* (e.g. *doina.banciu@meteo.inmh.ro*).

And, thanks to Mateja Irsic, informations on ALADIN teams are now up-to-date on the ALADIN web site.