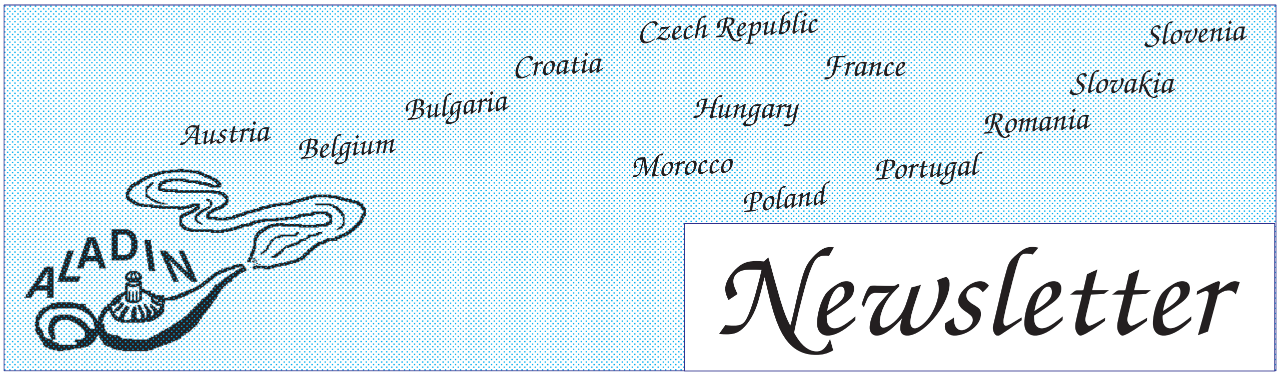

Number 9 October 1997 - December 1997

This Newsletter presents you the principal events concerning ALADIN during the quarter of year mentioned above. The news about work or events outside Toulouse are related with informations that you sent (for disponibility constraints, the "deported" work deals with the previous quarter).

So, reading this Newsletter, you will know everything about ALADIN activities (more precisely everything I was told about) between October 1997 and December 1997 (except for the work realized outside Toulouse : between July 1997 and September 1997).

Please do bring to my notice anything that you would like to be mentioned in the next Newsletter (number 10) before the 10th of April 1998.

Any contribution concerning announcements, publications, news from the ALADIN versions on workstations or on big computers, verifications results, ... will be welcome. This deadline is particularly important for the report of the deported work each representative should sent every quarter.

If needed, please contact :

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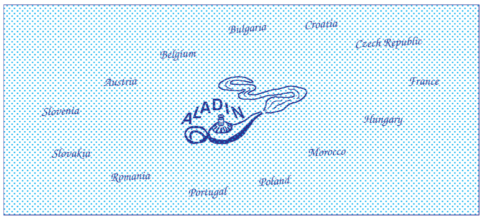
METEO-FRANCE
42, avenue Gustave Coriolis
F-31057 TOULOUSE-CEDEX
Tél : (33) 5 61 07 84 74 ; fax: (33) 5 61 07 84 53
(from France replace 33 by 0)
email : patricia.pottier@meteo.fr

Many thanks for all of you who have sent me most of the informations reported here.

Main events

1. The 2nd Assembly of ALADIN Partners, Brussels, December 5th, 1997



Second Assembly of ALADIN Partners
Brussels, Friday 5th of December 1997

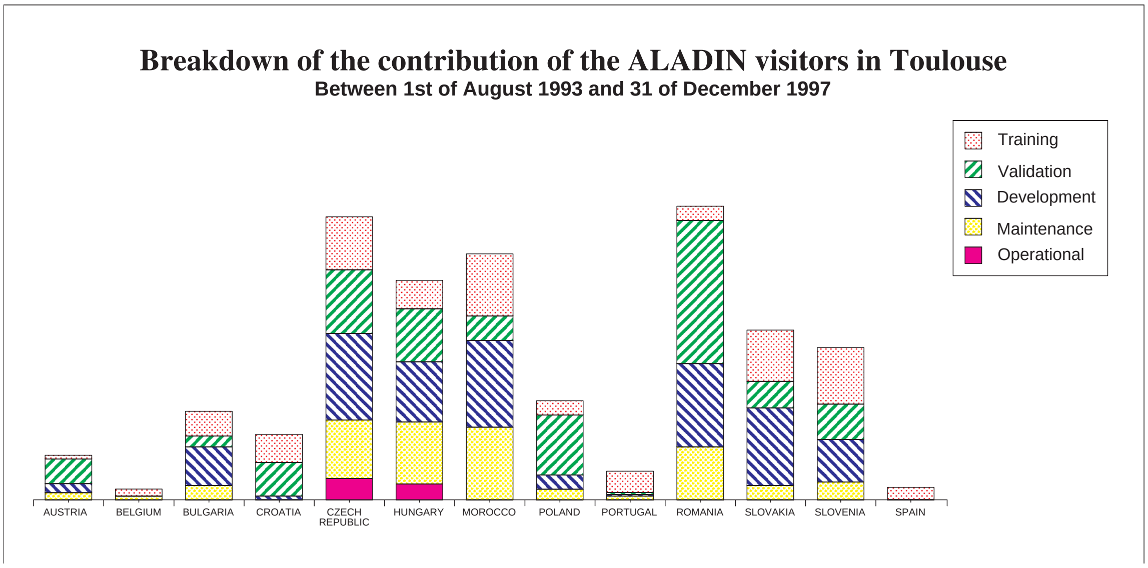
The second assembly of the ALADIN Partners took place in Brussels the 5th of December 1997. Thirteen countries were represented.

Two amendments to the Memorandum of Understanding were unanimously accepted by all Partners. They deal with the conditions of use of the ALADIN software.

The main steps of implementation or development of ALADIN-BELGIUM, ALADIN-FRANCE, ALADIN-LACE and ALADIN-MAROC models were presented. ALADIN-BELGIUM is at the present the operational mesoscale model with the finest resolution in the world. ALADIN-FRANCE whose domain has been extended in order to provide suitable coupling data for Portugal has been declared fit for operational use after a long validation process. The integration of the ALADIN-LACE model in the operational forecasts area is working well : this integration has been tested successfully during the severe floodings events in July 1997. The presentation about ALADIN-MAROC essentially dealt with plans about assimilation of TOVS and radar data.

The switch to ISBA was the main point of the discussion about operational problems (cf. « Major change in the ALADIN code »). The problem of the code maintenance was raised. The necessity for each Members to devote staff to the maintenance and the core developments of ALADIN was pointed out.

The 1998 ALADIN Partners commitments were presented and the 1997 commitments were assessed : realization at 98%. The project is on continuous growth and development but the report on the evaluation of the ALADIN project also underlined some crucial problems such as the too frequent renewal of the research teams in several countries or the separation between research and maintenance tasks to be devoted to the ALADIN visitors in Toulouse. Among the other main outlooks for the project discussed, the need of a moderate shift of interest from physical parametrization to dynamical and numerical problems appeared.

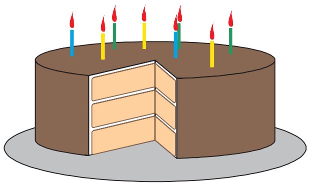


As an inter-Partners collaboration, Météo-France proposed to ALADIN members a license free of charge for national use of MEDIA model. A collaboration for the development of an ALADIN-MEDIA model for emergency situations was wished by different participants.

A complete report on this second Assembly will be available very soon from the Royal Meteorological Institute of Belgium.

Dr. I. Obrusnik has invited ALADIN Partners for the third Assembly in Praha (Czech Republic) in the beginning of November 1998.

2. *A birthday*

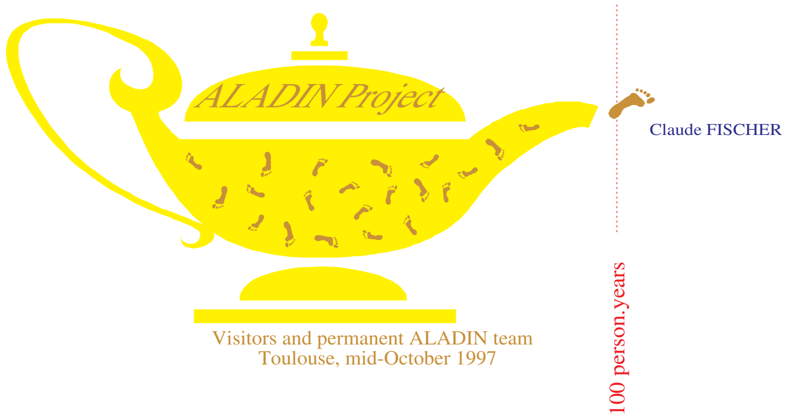


What could have mobilized one hundred people during one year ?

What could have taken a century of hard work for a single poor person ?

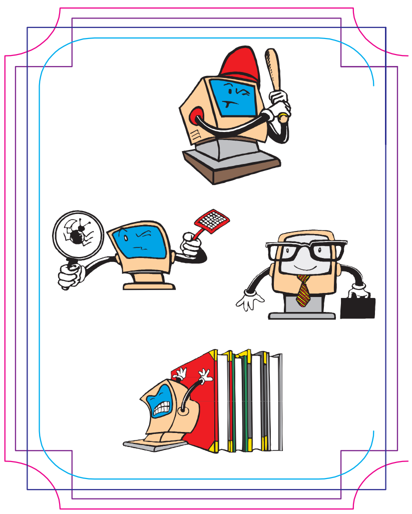
In a more realistic point of vue, what has necessitated 100 person.year ?

Answer : ALADIN project of course (including deported and Toulouse work), at a date situated between the 16th and the 30th of October 1997 (no precision under fortnight in our statistics)...! After numerous computations we can point out who made the very small step responsible for this big step for ALADIN humanity ...

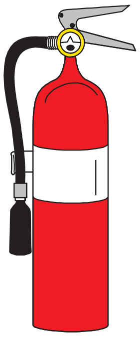


3. *A*ladin **WO**rkstation **C**oordination birth

The main point of the agenda of the last informal ALADIN meeting organized besides the EWGLAM/SRNWP Conference was the discussion on the definition of the AWOC (Aladin Workstation Co-ordination group). Following the comments presented during this meeting, a AWOC definition document has been proposed and four AWOC members have been intrusted : one LACE representative (Jure Jerman from Slovenia), one SELAM representative (Liviu Dragulanescu from Romania) and two representatives from Météo-France (Patrick Le Moigne from GMAP/EXT and Jean-François Estrade from SCEM/TTI/Valparaiso team). The proposed document aims to define the position of the AWOC, its composition and way of working, as well as its main tasks.



4. *Emergency-ALADIN over Malaysia*



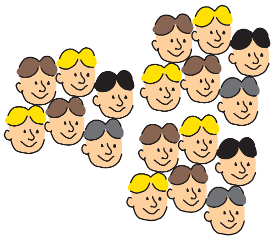
Last October, Malaysia suffered from heavy smoke at large scale caused by burning forest in Indonesia. Link to an humanitarian mission of French people in Lawlessly (including a forecaster from Météo-France), special meteorological products have been made available in Malaysia thanks to the Internet access of the French Embassy. Among these products one set deserves a special attention : fine resolution ALADIN forecasts covering Malaysia and Indonesia.

Due to relatively bad resolution of ARPEGE in this part of the word (about 180 km) at set of 2 ALADIN versions has been installed : a 60 km resolution one getting its ILBC from ARPEGE and coupling a 20 km one. The ALADIN maps (especially precipitations and low level winds, having a large impact on he smoke conditions) where used every day and were judged very useful. The ALADIN/Malaysia suite has run until the 18th of November 1997.

This temporary implementation of ALADIN is double success : the flexibility of the system has allowed us to install the whole suite within 1 day (with an intense involvement of Research Team and Operation Team) ; the quality of the products, despite of the exotic location of the domains, has been assessed by our forecaster and his Malaysian colleagues. This exceptional achievement is highly encouraging for all of us.

Conferences/Workshops

1. *Conference EWGLAM/SRNWP, Budapest, 6-10 October 1997*



The 19th European Working Group on Limited Area Modelling and the 4th Short Range Numerical Weather Prediction Network joint meetings took place in Budapest (Hungary) last 6-10 October.

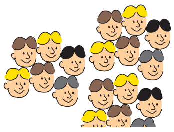
As usually, presentations from the five main LAM groups in Europe (ALADIN, DWD/SMA, HIRLAM, LACE, UKMO) were followed by national presentations. Then scientific ones essentially related to coupling. A discussion ended this EWGLAM part of the conference.

The SRNWP part of the meeting began with a status report of the lead centres for surface processes and assimilation, variational assimilation, semi-Lagrangian time schemes, non-Hydrostatic modelling, common verification of NWP models. The first two ones proved to work better. A discussion took place on the exchange of code within SRNWP. The question of a SRNWP coordinator was raised.

More information about this conference can be found in the proceedings which should be available soon.

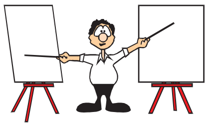
The next conference will be held in Copenhagen in October 1998, 5-10th.

2. Informal ALADIN meeting besides the EWGLAM/SRNWP Conference



On Wednesday 8th of October in the evening, a short ALADIN meeting was organized besides the conference and gave us the opportunity to take stock of ALADIN workstation version (cf. « AWOC ») and ISBA implementation at Météo-France (cf. « Major change in the ALADIN code »).

3. Atelier de Modélisation de l'Atmosphère, Toulouse, 2-3 December 1997



ALADIN model was present in the "Atelier de Modélisation" held in Toulouse, 2nd-3rd December 1997. V. Ducrocq (CNRM/GMME) established diagnostics based on the ALADIN model for convection forecasting. A. Horanyi (Hungary) took stock on the adaptation of 3D-Var technique to ALADIN model. A subjective and an objective validation was presented by J-M Moisselin and M. Tardy (SCEM/PREVI/Compas) : ALADIN appeared better than ARPEGE for most of the parameters controlled.

Announcements

4. ALADIN Workshop to be held in Toulouse on February 18-20th, 1998 (following)

As explained in the last Newsletter, the different implementations of ALADIN create a new necessity : an increased communication at the technical level between us and a well established coordination for all future evolutions of the code. The proposed workshop will help us to well identify the way how we should work together from now onwards, on the technical point of view (code management, machine dependance, ...). It will benefit from the discussions already organized around the worskstations versions of ALADIN (If. AWOC for the specialists). The workshop will last three days, on the 18th, 19th and 20th February 1998. The first day would be dedicated to oral presentations. Practical activities would be organized during the second day. A one day discussion would conclude the workshop and define a clear strategy on the technical issues. The participation should be typically one person per ALADIN country (possible flexibility on that point).

Please contact Joel.Hoffman@meteo.fr for any comments on this proposal.

5. Major change in the ALADIN code (following)

In October 1997, Jean-François GELEYN sent a letter to all ALADIN-Members NMSs' Directors and all ALADIN contact points for operational or pre-operational applications in order to clarify the situation about the potential replacement of the current surface parametrization of ALADIN by the so-called "ISBA" more realistic and advanced scheme. All these ALADIN Contact points should have received a second letter to update the previous one with an up-to-date status of the latest developments, an update proposal "What to do ?". The consequences of the few changes explained in this letter are that we may delay the ISBA exercise by roughly one month but that there is not any more a 100% deadline. Otherwise the need for a unique target date for switching all applications and the consequences of this constraints remain unchanged.

Contacts & Informations

These informations (and others) are available on a public ftp : cnrm-ftp.meteo.fr, under the directory /pub-aladin. Please connect on user anonymous and use you e-mail address as your password.

Some mailing also lists exist to make our correspondence smoother (details in the previous Newsletter); for example, the general list aladin@meteo.fr.

Money Funding asked for some cooperations based on the ALADIN project

1. *INCO-COPERNICUS keep-in-touch, so-called ‘‘ALADIN-KIT’’*

The funding from the ALADIN-KIT will be used for financing participations to the following meetings : - Workshop in Toulouse (February 1998) - Workshop in Prague (June 1998), - EWGLAM/SRNWP in Copenhagen (October 1998). Please contact joel.hoffman@meteo.fr.

2. *Embassies support*

For 1997 fundings, the last visits supported by the Ministry of Foreign Affairs have been planned until June 1998.

The request for 1998 fundings have been sent to the Minister for most of the countries. More details can be asked to Météo-France/DGS/IE/Arlette Rigaud (arlette.rigaud@meteo.fr).

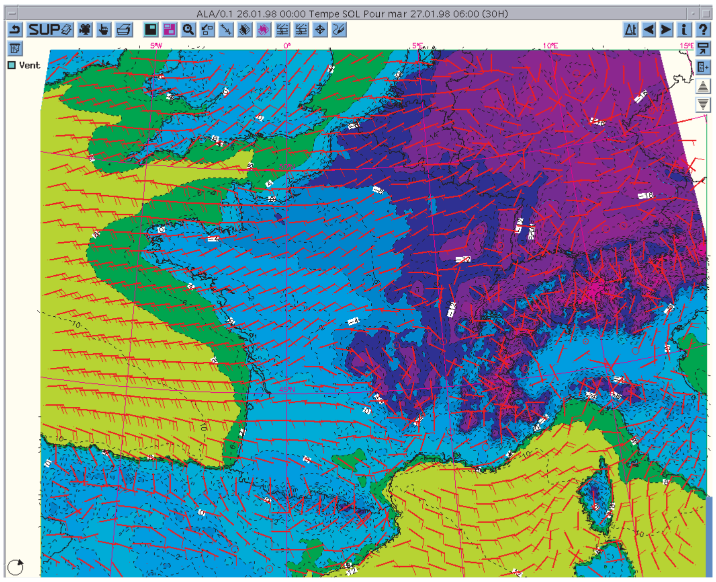
The (pre-) operational ALADIN models on big computers

1. *Operational ALADIN-MAROC in MAROC-Météo*

(more details mehdi.elabed@meteo.ma)

2. *Operational ALADIN-FRANCE in Météo-France*

(more details emmanuel.legrand@meteo.fr)

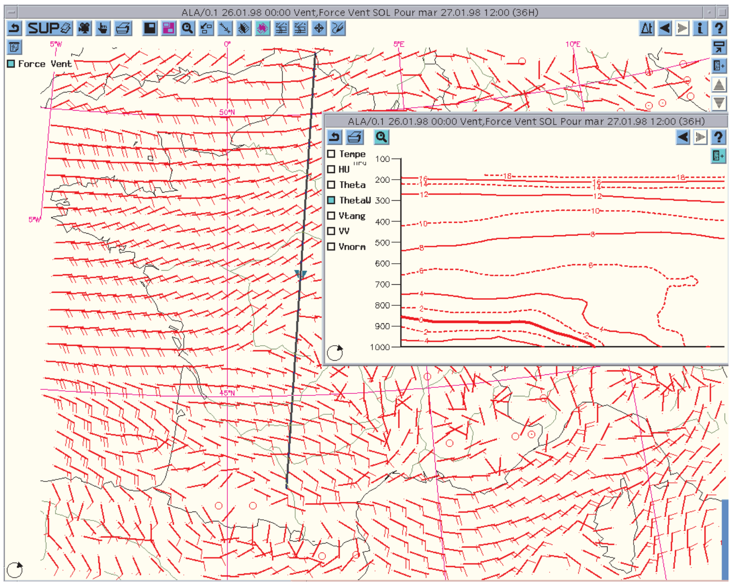


After a long validation process (more details in "Verification of ALADIN-FRANCE), including a 3-month period of intensive study by the central and regional forecasters, ALADIN-FRANCE has been finally declared fit for operational use. Following technical steps have been made:

- the execution time is now as early as possible, according to the capacity of the CRAY C98 and to the issue of coexistence with ARPEGE in the same time on the computer. The 36h ALADIN-FRANCE forecast is now available at 3h45/15h30, approximately 45mn earlier than before. This is not as good as the initial objective, which was to have it at 3h/15h: this will be achieved only on the new Fujitsu VPP700 computer, scheduled to become operational mid-1998.

- the dedicated links between Toulouse and the 7 regional centres have been upgraded to 384 Kbit/s at least (higher capacity for Paris). This allows us to add ALADIN numerous fields to the existing ARPEGE dissemination

- Some ALADIN-FRANCE fields are routinely disseminated to the local centres (more than 100 of them in France) using the RETIM4 channel.



Two actions still need to be completed:

- the installation of a "parallel suite" for ALADIN-FRANCE

- the enhancement of the SYNERGIE interface, giving access to the central and regional forecasters to more ALADIN-FRANCE fields than now (regular Toulouse visitors can recognize our "vent d'Autan" on the two examples of ALADIN forecast on SYNERGIE interface).

These 2 actions are scheduled beginning of 1998. The next step will be then the porting of the whole NWP operational suite (ARPEGE + ALADIN-FRANCE) on the new Fujitsu.

Further news in the next newsletter...

3. Pre-Operational ALADIN-LACE in Météo-France

(more details bubnova@chmi.cz)

4. The operational implementation of ALADIN-BELGIUM

(more details luc.gerard@oma.be)

5. Future ALADIN-LACE in CHMI

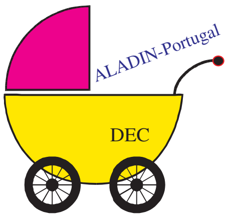
(more details : janousek@chmi.cz)

The ALADIN models on workstations : activities since September 1996

A new ALADIN version is born in the Instituto de Meteorologia in Lisbon. The cradle is a Dec Workstation (see above).

Very few changes for the other versions since the (comprehensive) reports presented in the last Newsletter. You will be told everything about the workstations version of ALADIN in the next Newsletter with the additional report of ALADIN Workshop to be held on workstation versions of ALADIN.

1. Workstation version at the Instituto de Meteorologia (Portugal)



(more details mario.almeida@meteo.pt)

The ALADIN version 7 has been installed on a DEC Workstation (operating system OS/1-V4.0). The choice of a correct configuration and the usage of several facilities within ALADIN including the CANARI option in a workstation environment have been made easier thanks to Liviu Dragulanescu 5-day visit. The next step is the creation of climatological files corresponding to the new geographical zone.

2. Workstation version at Hungarian Meteorological Service

(more details horanyi@met.hu)

As it was mentioned in the last Newsletter the Hungarian Meteorological Service decided to purchase a DEC 600 Au Personal Workstation for running the workstation version of ALADIN on it. The most important characteristics of this workstation are as follows:

CPU clock rate: 600 MHz
RAM: 512 MB
Hard Disk: 8 GB
specfp_95: 21.3
OS: DEC UNIX
Software: FORTRAN90, ANSI C

First of all we have started to prepare the domain to be used for the workstation version of ALADIN. After consulting with the forecasters and taking into account the characteristics of the workstation the following domain was chosen:

CORNERS: Lower left fi=42.5; lambda=10.5
Lower right fi=42.65; lambda=25.24
Upper left fi=52.11; lambda= 8.79
Upper right fi=52.3; lambda=26.5
NUMBER OF POINTS: 112 * 100 with 27 vertical levels
RESOLUTION: 10.89 km

The model will be coupled by ALADIN/LACE (the coupling files are produced in Toulouse since 19th November, 1997) and the climatological files were also prepared. According to our plans we would like to put the workstation version of ALADIN into operations (having integrations twice a day for 48 hours) in the near future.

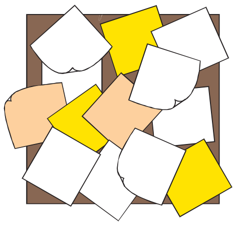
3. Workstation version at Slovenian Meteorological Service

(more details mark.zagar@rzs-hm.si)

The quasi-operational activity at HMIS went on in the last quarter of 1997. Existing morning suite of ALADIN/SI has been complemented by the afternoon suite, having exactly the same time schedule. Due to the improved operational script of ALADIN/LACE in Toulouse, which prepares the national subdomain for Slovenia parallely with the integration of the model, ALADIN/SI now starts at 03:01 UTC and finishes at 04:23 UTC (+12 hrs for the afternoon run). The cycle 7 of the code is being used for operational purpose. The model outputs are appearing on visualization system in parallel with model run. Forecast of ALADIN/SI is presented to the forecaster and every interested person at HMIS in several ways: as fields of variables at different levels, as point forecast by stations and variable (particularly 2m temperature and precipitations) and as forecast infra-red satellite image. All this information is available at IntraNet and is best viewed by an http viewer. The same visualization is now used for ALADIN/LACE results as well, and is based on NCAR graphics package. You can have a look at some public available products at http://www.rzs-hm.si/napoved/aladin.html. For detailed wind forecast at the resolution of 2.5 km the dynamic adaptation of ALADIN/SI and ALADIN/LACE forecast can be performed on demand. Tkcs X window interface for ascs has been developed by Gregor Gregoric. It is installed also on Andante, have a look in ~mrpe694/cs/README for instructions.

Scientific topics for 1998 around ALADIN (mostly to be done in Toulouse)

(not in priority order)



The above list is a preliminary list of scientific topics to be covered in 1998 as far as ALADIN is concerned. The list was compiled by Jean-Francois Geleyn with the help of Andras Horanyi and it is emphasized that it is a preliminary one as far as the subjects and also the persons are concerned. It is possible that some interesting and/or important topics were forgotten, so you are kindly asked to contact them in that case. It is also asked to propose some persons for those topics where there are no names or question marks can be found.

An extra level of coordination is desirable in the following topics: variational data assimilation, non-Hydrostatic, modelling and the lateral boundary condition problem. In these subjects both coordinators were nominated : one from Météo-France side and one on the behalf of the other ALADIN countries.

1. DATA ASSIMILATION

Scientific topics to be covered in 1998	Proposed names
Adapt the Jb term from ARPEGE/IFS (statistical balance) to ALADIN	L. Berre (France) M. Siroka (Slovakia)
Possible use of incremental/decremental approach together with spectral coupling in 4DVAR; if not problem of the consistency of 4DVAR strategies between the coupling model and the coupled one	V. Ivanovici (Romania) L. Dragulanescu (Romania)
Incremental DFI in coupled data assimilation mode	V. Ivanovici (Romania) L. Dragulanescu (Rom.) W. Sadiki (Morroco)
Extension of DFI to grid-point variables for a potential use in spectral coupling mode and in 3.5DVAR	??? D. Giard (France)
Scientific study of sensitivities of forecast errors to initial and lateral boundary conditions ("poor man's 4DVAR")	C. Soci (Romania) L. Dragulanescu (Romania)
Study the balance requirements for variational dat assimilation	S. Issara (Morroco)
Single observation experiments using optimal interpolation (CANARI)	E. Cordoneanu (Romania) C. Soci (Romania)
Calculation of observation errors using the Hollingsworth-Lonnberg technique	Y. Wang (Austria)
Refinement of observation operators for ALADIN	L. Gaytandjieva (Bulgaria)
Impact of surface analysis, with CANARI and ISBA in ALADIN	M. Zitouni (Croatia)
4DVAR experiments using simplified physics	M. Janiskova (Slovakia)
Diagnostics on the calculation of background error covariances using the NMC method	M. Monteiro (Portugal)
ISBA in CANARI, relative humidity from TOVS data	S. Issara (Morocco) R. Ajjaji (Morroco)

2. DYNAMICS

Scientific topics to be covered in 1998	Proposed names
Technical problems related with the TL and AD of the non-Hydrostatic SL dynamics	M. Charron (Canada) M. Janousek (Czech R.)
Calculation of singular vectors using Lanczos algorithm (configuration 601)	F. Chome (Belgium)
SL version of the elastic version of the model	M. Janousek (Czech R.) R. Bubnova (Czech R.)
Increased sophistication of the "free-slip" lower boundary condition for the elastic version of the model	R. Bubnova (Czech R.)
Introduction of the SL formalism for the lower boundary condition	D. Eemas (Slovenia)
Relaxation of the thin layer hypothesis and simultaneous introduction of the vertical part of the Coriolis force	D. Dvorak (Czech R.)

Study of the coupling between a hydrostatic coupling model and a non-Hydrostatic coupled one	F. Prates (Portugal)
Trial of linear (semi-linear) grids	M. Marku (Albania)
Experiments with increased vertical resolution	M. Caian (Romania) E. Zsoter (Hungary) J. Boutahar (Morroco)
Experiments using spectral coupling	M. El Abed (Morroco)
1D vertical model	M. Zagar (Slovenia)
Conservation properties of a two-time level semi-implicit SL scheme	I. Gospodinov (Bulgaria)
Dynamical and physical control of kinetic energy spectra	F. Vana (Czech R.)
Radiative upper bundary conditon for accustic waves	J. Vivoda (Slovakia)
Interaction between orography and gravity wave drag	R. Mladek (Czech R.)
TL of post-processing	L. Dragulanescu (Romania)

3. PHYSICS

Scientific topics to be covered in 1998	Proposed names
Extension of the physics to the non-Hydrostatic framework	L. Gerard (Belgium)
Introduction of ozone as prognostic variable	Some interest from Croatia
More sophisticated treatment of the radiative propertiesof the clouds	C. Madeira (Portugal) J.-M. Piriou (France)
Exploration of the evolution towards higher order closure representation of the turbulence	D. Dufkova (Czech R.) E. Bazile (France)
Study of the problem of internal downdrafts (also as a potential replacement for a separated parametrisation of shallow convection)	T. Haiden (Austria)
Cloudwater as prognostic variable	D. Banciu (Romania)
CROCUS, snow model	V. Spiridonov (Bulgaria)
Closure for convection	M. El Abed (Morocco)
Intercomparison of physical parametrization packages	J. Vivoda (Slovakia)

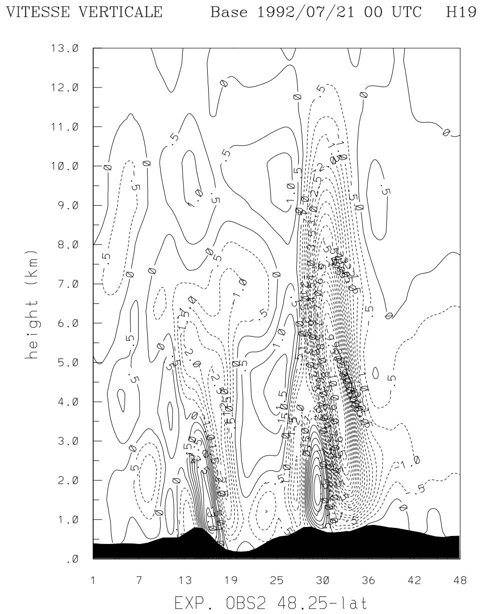
4. COORDINATORS:

TOPICS	FRANCE	ALADIN team outside FRANCE
variational data assimilation	Vincent Casse	Andras Horanyi (Hungary)
non-Hydrostatic modelling	Martin Charron	Radmila Bubnova (Czech Rep.)
LBC problem	Patricia Pottier	Vladimir Ivanovici (Romania)

''Réseau Formation Recherche'' : PhD Studies

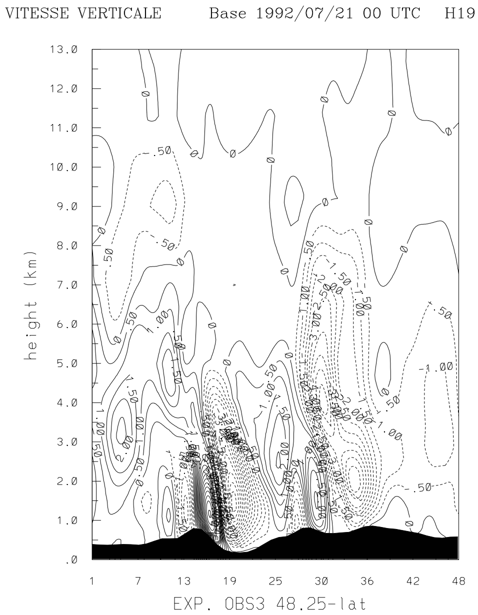
- Filip VANA : nothing new since the report in the last Newsletter.
- Mark ZAGAR : nothing new since the report in the last Newsletter.
- Ilian GOSPODINOV : nothing new since the report in the last Newsletter.

- Doina BANCIU : A new experiment concerning the capacity of the ALADIN model to forecast squall lines has been carried out on a fast moving squall line developed over Southwestern Germany and Switzerland in the prefrontal area of a cold air on 21 th of July 1992. The evolution of this squall line was the subject of several detailed real data analysis (Haas et al., 1997, "The squall line of 21 July in Southern Germany: an observational Case Study", Beitr.Phys.Atmosph, May, vol 70, p. 147-165, Finke, U. and Hauf, T.,1997, "the severe convective storm in Central Europe on July 21,1992 - a research dataset", DLR-Mitteilung 97-02) and of numerical simulation (see Wergen, W., 1994, "Recent LAM activities at DWD", LAM Newsletter, no. 24, p. 77-79).



  This situation was studied thanks to the successive nesting : ARPEGE integration started with ECMWF reanalysis; a first ALADIN integration over a domain of 2000 x 2000 km with a mesh size about 12 km; a second ALADIN integration over a smaller domain (1200 x 1200) with an increased horizontal resolution (~7km).

  The structure and the development of the simulated squall line were compared to satellite and radar data analysis. Nuclei of associated downward and upward motion have been correctly simulated (cf the vertical cross-section over South Germany obtained without -OBS2, and with -OBS3, downdraft parametrization). The effect of the downdraft parameterization was greater than for other situations, probably thanks to better initial conditions.



  But although the squall line was correctly simulated, the surface wind velocity had smaller values than the observed ones. More verifications are necessary to evaluate the real effect of downdraft parameterization.

- Marta JANISKOVA : The experiments to include simplified physical parametrizations in the 4D-Var system of the global forecast model ARPEGE went on. Tests on physical parametrization schemes of vertical diffusion, gravity wave drag and large scale precipitation have been done on FASTEX (Fronts and Atlantic Storm Track Experiment) situations. The behavior of the incremental 4D-Var assimilation with physical parametrizations, in a concrete realistic situation, was studied through its comparison to 3D-Var and 4D-Var assimilations using an adiabatic model. The quality of convergence of the variational scheme and the evolution of cost functions for 6-hour a assimilation cycle were first checked. Then, forecasts were performed up to 72 hours starting from the initial state obtained using the different assimilations. The preliminary results clearly indicate that other experiments will be necessary to improve the quality of the 4D-Var data assimilation system. However, despite the lack of tuning, 4D-Var with simplified physics prove to have a favorable influence of cost functions and is able to fit some physical processes even better than it was expected.

VERIFICATION OF ALADIN-LACE CLOUDINESS FORECASTS IN AUSTRIA

(more details thomas.haiden@zamg.ac.at)

SYNOP surface station cloud amount observations at some Austrian locations and total cloudiness predictions of operational ALADIN-LACE and ECMWF were compared on a simple point-to-point basis. The idea is to learn more about the strengths and weaknesses of the cloudiness parameterization in ALADIN in order to see where improvement are needed most. The results presented below are, however, preliminary and are to be followed by a more in-depth analysis.

The evaluation included 7 stations at major cities, with two of them located within the Alps (Innsbruck, Klagenfurt), two at the Alpine rim (Graz, Salzburg), and three in lowland areas (Linz, St.Pölten, Vienna). The period studied was 97/06/12 to 97/12/31 (203 days), evaluation times were 06, 12 and 18 UTC. Occurrences of ground fog were excluded from the statistics. Table 1 shows the rms errors at these stations for ALADIN and, for comparison, the rms error of the ECMWF short-range forecast. Both grid-point fields were interpolated bilinearly to the station locations.

Station	**rms (ALD) [1/8]**	**rms (ECM) [1/8]**
Linz	2.36	2.44
St. Pölten	2.23	2.29
Vienna	2.23	2.36
Innsbruck	2.42	2.21
Salzburg	2.40	2.58
Klagenfurt	2.77	2.82
Graz	2.46	2.41
Total	2.41	2.45

Table 1 : Root-mean-square error (in octas) of short-range total cloudiness predictions by ALADIN-LACE and by ECMWF for some Austrian stations.

On average, ALADIN gave slightly better point predictions than ECMWF, mainly due to higher skill at the lowland stations. Largest errors were found for Klagenfurt in both models. Inspection of contingency tables for observed vs. ALADIN total cloudiness reveals that in Klagenfurt there is a higher number than at other stations of cases with 0-1/8 predicted and 7-8/8 observed. Closer analysis shows that in most of these cases there was high inversion fog (low stratus, low stratocumulus) present, covering valleys and lowlands, with mountain stations reporting at the same time much less, or even zero, cloud cover. The ALADIN predictive skill at such occasions is improved significantly when only the cloud amount observed outside the boundary layer is used for comparison.

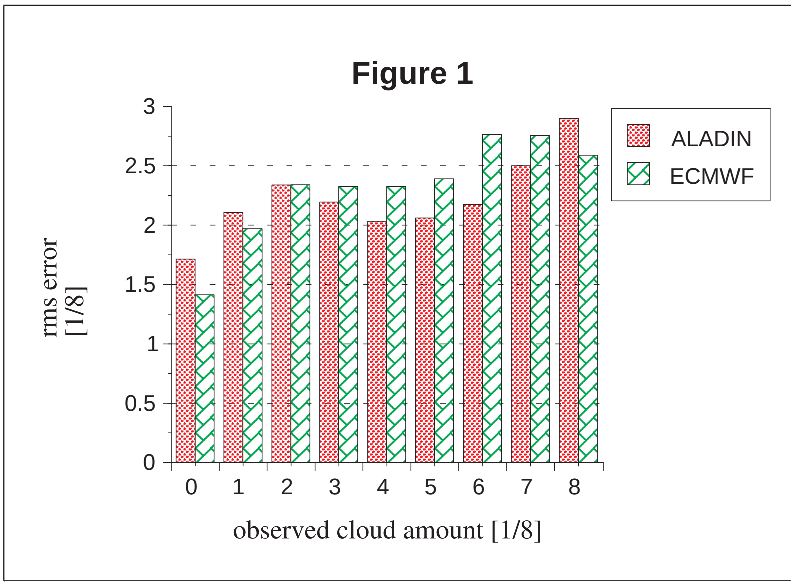


Figure 1 shows results of all stations combined, and stratified according to observed cloud amount. While ALADIN performs better than

ECMWF in the range 3-7/8, the forecast of zero and full cloud cover are less satisfactory. It is basically due to ALADIN predicting more frequently than ECMWF 1-2/8 cloudiness when there actually was none, and 6-7/8 when full cover was observed. Further investigation is required to determine the synoptic settings in which these cases occur.

For the operational forecaster it is useful to know the reliability of a prognostic variable as a function of its predicted value (rather than the observed one), because it is the only value available a priori. In practice the most essential distinction is between little cloudiness, including clear sky, medium cloudiness, and near or full overcast. Accordingly, we lump together cloud amount values into the three equally sized ranges 0-2, 3-5, and 6-8 octas, and determine the probability of the observed amounts falling into the predicted ranges (Table 2).

	0-2 octas	**3-5 octas**	**6-8 octas**
p(ALD)	66.5	24.1	81.5
p(ECM)	58.1	24.6	84.0

Table 2 : Probability p (in %) of different model forecasts being true.

There are large differences of forecast reliability between different ranges. The greatest amount of information seems to be contained in the 6-8/8 forecast which for both models holds true in more than 80 % of cases. In the 0-2/8 range, ALADIN forecasts are significantly more reliable than those of the ECMWF. Note that for medium (3-5/8) cloud amount predictions, the reliability of both models is extremely low. It follows that there is a systematic deficiency in the parameterization of total cloudiness in the models. In the majority of these incorrect, medium prediction cases, actual cloud cover was 7-8/8, caused by elevated fog layers that where not present in the models. The fact that these layers of low stratus often occur when there is little upper cloudiness may explain the negative correlation between forecast and observation.

It is important to note that the simple point-to-point rms calculation applied here favours smooth, low variance fields. Thus, in a case where the spatially and temporally more variable ALADIN forecast manages to achieve the same rms as the corresponding ECMWF field, it is very likely superior with regard to field structure and patterns. It should also be stressed that the period studied is too short to reveal actual model climatology.

ALADIN-FRANCE intensive validation - winter 1997

(more details jean-marc.moisselin@meteo.fr or francis.pouponneau@meteo.fr)

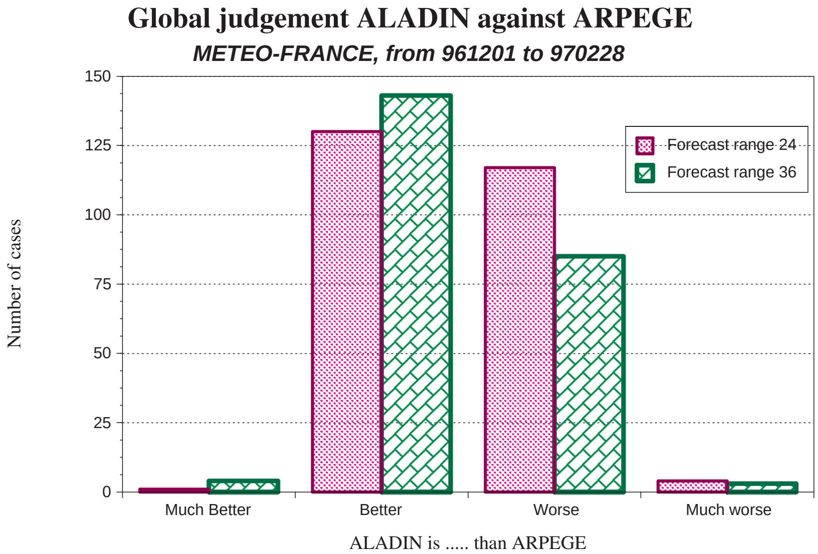
ALADIN-FRANCE is a limited area model wich uses ARPEGE initial and boundary conditions. The maximum forecast range is 36H.

Before ALADIN-FRANCE intensive period of validation at Météo-France by national and regional forecasters, many studies have proved the impact of the model, compared to ARPEGE. For example, the "Cas de Béziers" showed the capacity of ALADIN to forecast massive precipitations.

During the three months period of intensive validation at Météo-France from 1996/12/01 to 1997/02/28, regional centers and central center forecasters had to choose between ARPEGE and ALADIN-FRANCE (subjective validation). The question was "in an operational context what model do you choose". The "equal" choice were excluded and forecasters had 4 choices.

Most of judgements were "ALADIN better" or "ARPEGE better". Only 1% of the judgement were "ALADIN much better" or "ARPEGE much better".

Next figure shows that forecasters choose more often ALADIN, even at the 36H forecast range.



The results are quite the same for the objective validation : there are *no big differences* between ARPEGE and ALADIN but *ALADIN is almost always better than ARPEGE* (except for precipitations during the validation period)

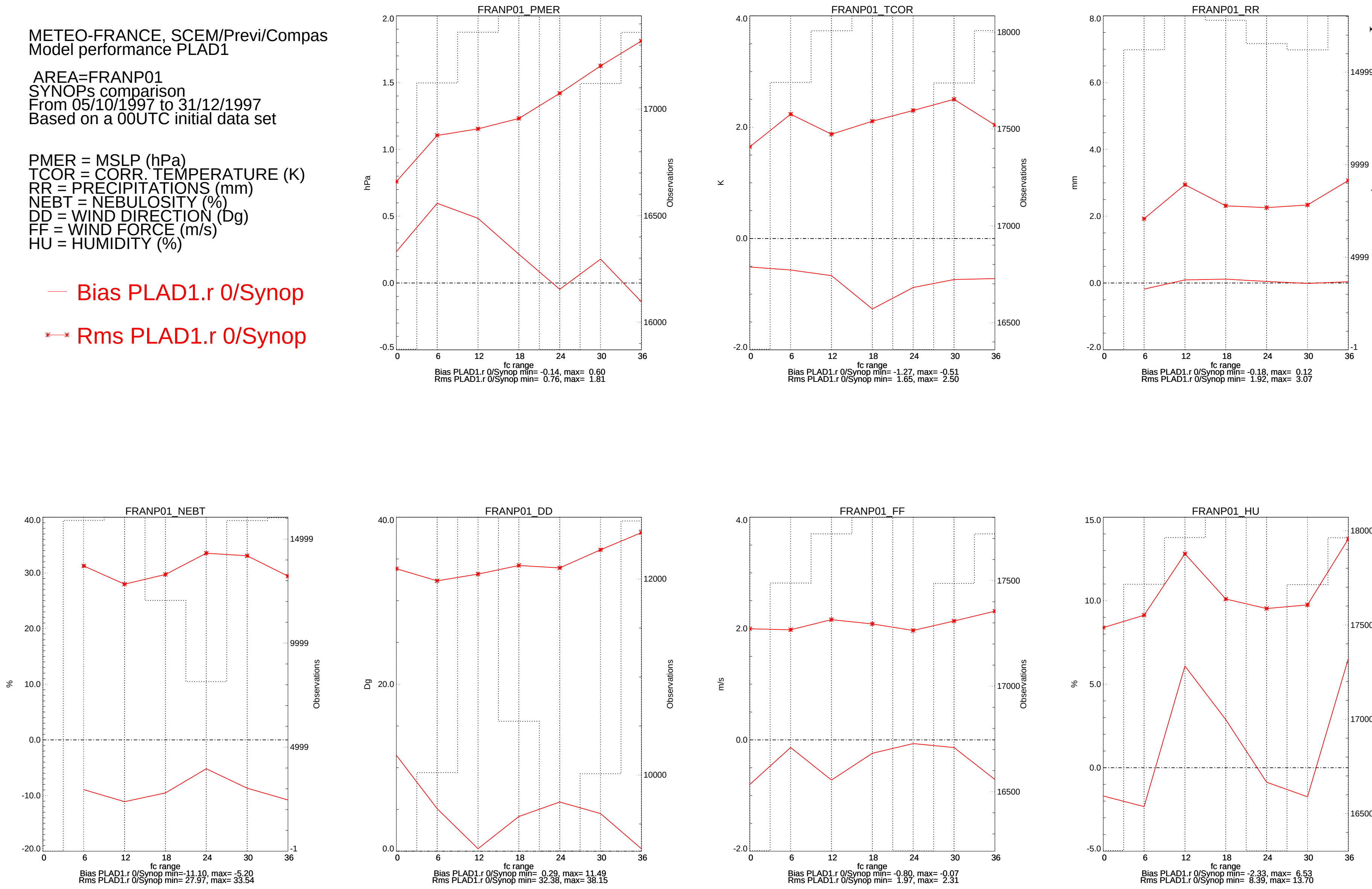
Scores on ALADIN-FRANCE during the last quarter of 1997

(more details jean-marc.moisselin@meteo.fr or francis.pouponneau@meteo.fr)

The scores (bias and root mean squared error) plotted on the figure on the next page correspond to the scores calculated against surface observations SYNOP over the domain ALADIN-FRANCE (FRANP01). Scores are averaged over the last three month of 1997, for each 6 hours time-step. RMS and bias are the average of the daily RMS and bias (weighted by the number of observations).

Some comments :

- *MSLP :* The RMS rises with time-step (from 0.8 to 2.0 hPa) ; The bias has a large amplitude (from 0.2 to 0.5 hPa) during the first 12 hours and decreases with respect to increasing time-step.
- *CORR-TEMPERATURE* : The RMS and the bias are large even at 0 hour forecast range (about 2 degrees).
- *PRECIPITATIONS :* High amplitude of the RMS at 12 and 36 hours for the RMS (2.9 and 3.0 mm) while the bias is quite null.
- *NEBULOSITY* : The RMS is important, but does not vary a lot with forecast range (from 28 to 33 %). The bias is relatively strong.
- *WIND Direction and FORCE :* Despite an initial high intensity, the bias becomes relatively weak after 6 hours. However the RMS is very high during the whole integration.



- *Humidity* : There is a diary cycle of the error of the RMS and bias (amplitude RMS 13%, amplitude bias : 6%).

Participations in the ALADIN project

The statistics about the participations in the ALADIN project and the ensuing compilation of the ALADIN developments is drawn up from the contributions sent by the representative of each country. Please find in annex a few graphics illustrating the last summary of the participation in the ALADIN project.

In the next two parts ("Deported developments during the third quarter of 1997" and "ALADIN developments in Toulouse during the last quarter of 1997"), you will find the list of the ALADIN developments (in and outside Toulouse) excepted those detailed in the previous pages : PhD studies, developments for workstation versions or operational suite, work on data assimilation, ... during the quarters concerned by this Newsletter. The following informations concerning the deported developments are obtained from informations you sent.

Deported developments during the third quarter of 1997

During these four quarters, more than 40 persons have worked on ALADIN "at home" (i.e. in their NMS : not in Toulouse) and their global effort represents more than 50 people.month during this period.

1. In Austria

- Analysis and verification about the heavy rain event in July 97 (H. Seidl, T. Haiden, G. Hermann, G. Skoda)
- Programs for decoding, interpolation and derived quantities of retrieved ALADIN data from Tel Arc-server in Vienna (H. Seidl)
- Verification of the ALADIN product cloudiness (T. Haiden).

2. In Belgium

- Implementation of ALADIN in Belgium (L. Gerard), informatic aspects (J. Vanderborght)
- Administrative tasks (A. Quinet)
- Evaluation of the ALADIN products (J. Nemeghaire)

3. In Bulgaria

- Nothing this quarter.

4. In Croatia

- HRID : further development and optimization and visualization using GRADS graphical tool (D. Glasnovic, J. Smitlehner).

5. In Czech Republic

- Verification of the ALADIN pseudo-TEMPs (Z. Huthova)
- Adaptation of statistical procedures for the verification of ALADIN pseudo-TEMPs (D. Hlubinka)
- Writing of the review paper on the physical parametrizations of ALADIN (F. Vana)
- Evaluation of the benchmarks of ALADIN for the new computer for ALADIN in CHMI (R. Bubnova)
- Maintenance of the operational suite of ALADIN processing in the weather service and evaluation of the tenders for the new computer for ALADIN in CHMI (M. Janousek).

6. In Hungary

- Duties as Project Scientific Officer of RC-LACE, preparation of the workstation version of ALADIN for Hungary (A. Horanyi)
- Verification of ALADIN (I. Ihasz).

7. In Morocco

- Tests of new climatological files, tests of AL06 for E701 configuration (J. Boutahar, S. Issara, R. Ajjaji)
- Comparison of ALADIN-MAROC with ARPEGE (M. El Abed)
- Preliminary studies for the project "Improvement of the precipitation forecasts of ALADIN-MAROC (S. Issara, J. Boutahar), study of the impact of TEQREF and HDIRQ on the precipitations in ALADIN-MAROC (M. El Abed)
- Developments of graphical tools for supervision of the ALADIN-MAROC suite, development of a procedure for the creation of forecasted TEMP messages from the model, development of procedures for transforming CMAFOC files, FULL-POS files, etc... (R. Ajjaji).

8. In Poland

- Administration and NWP lab organization (M. Jerczynski, A. Dziedzic)
- Model implementation on Convex (M. Jerczynski)
- Getting skills in NWP (M. Szczech).

9. Portugal

- Portugal became a member of ALADIN project in April 1997. Until September 1997, no deported work for ALADIN was realized in Lisbon.

10. In Romania

- Post-processing and dedicated applications for aviation, air pollution applications (V. Ivanovici)
- The effect of better described orography over the SELAM area (E. Cordoneanu)
- Liquid water parametrization (D. Banciu)
- Data assimilation (L. Dragulanescu)
- Graphical post-processing (C. Soci)
- Convection parametrization, aeronautical applications (O. Valianatos)
- Precipitation verification, post-processing, tuning (C. Dutescu)
- Convection parametrization, air pollution parametrization, coupling problem (M. Caian).

11. In Slovakia

- Visualization of fields (J. Vivoda, M. Kanokovska)
- Verification of pseudo-TEMPs (M. Gera)
- ALADIN for workstation (O. Spaniel, M. Siroka)
- Subjective evaluation of ALADIN (A. Simon)

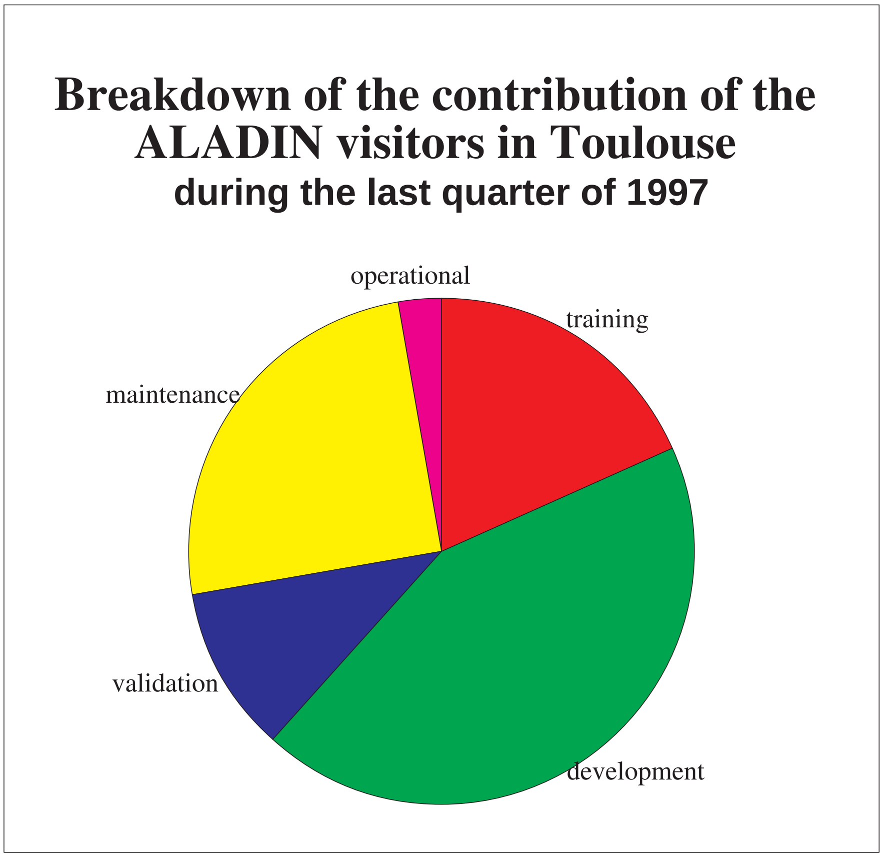
12. In Slovenia

- Verifications, coupling (N. Pristov)
- Visualization (J. Vehovar)
- Cycle 7, distributed memory, ISP movies (J. Jerman)
- Dynamical adaptation (M. Zagar)

13. Deported work by Météo-France

- Nothing this quarter.

ALADIN developments in Toulouse during the last quarter of 1997

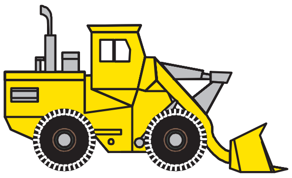


With the AL08 version of the code, one could hardly recognize his usual ALADIN model. Major changes inside the code and in the compilation orders have been introduced.

This huge work involved the energy of many of our visitors (R. Bubnova, D. Dvorak, M. El Abed, A. Horanyi, M. Janiskova, M. Janousek, J. Jerman, G. Radnoti, M. Siroka, O. Spaniel) or Toulouse members of ALADIN team (D. Giard, C. Fischer, P. Le Moigne) with the help of others people from CNRM/GMAP or SCEM/TTI.

Meanwhile, the others visitors dealt with their training, different developments, validation studies, ...

1. The new version AL08 : a brief overview by C. Fisher



From October 20th to December 10th, an important effort has been performed in Toulouse, in order to achieve the new cycle AL08 of ALADIN. Some twenty persons were involved, both among French support team and from the ALADIN partner countries. Besides the scientific developments (especially the implementation of the ISBA soil parametrization), the two main aspects of the new cycle concerned :

- The merge between the ARPEGE code, which had evolved significantly towards distributed memory, and the AL07 code, in which 3D-Var and non-Hydrostatic FULL-POS+ semi-Lagrangian had been included;
- The porting towards a distributed memory configuration, necessary for running the code on parallel computers. The new ALADIN code is now in true Fortran 90 and further cleaning is planned.

To the date of this Newsletter, the AL08 version exists and is (almost) validated on the CRAY-systems. In the next future, the validation on the Fujitsu VPP-machine will be performed. Though we have eventually overpassed our initial deadline for completion, we are currently in phase with the new ARPEGE cycle CY18T1, so that the status of the overall project is now clear with the respect to both scientific and informatic topics.

Finally, I want to thank here all those who have given part of their time and participated in this necessary phasing effort. And I look forward to seeing them or fellow ALADIN-users at the next phasing ...

2. *Research and development studies*

- A. Cherifi : "Control and monitoring of ALADIN"
- C. Dutescu : "Impact of the resolution on the precipitation in ARPEGE and ALADIN in aqua-planet mode"

  Experiments were performed on the global model ARPEGE and on its limited area version ALADIN, in order to study the impact on the precipitation field of the variable horizontal resolution and of the horizontal diffusion. Some test were also done to analyze the effects of the modification of the closure assumption of the deep convection parametrization scheme on the behavior of the two models.
- D. Dvorak : "Radiative upper boundary condition"

  This new radiative upper boundary condition should prevent reflection of vertically propagating gravity waves. More realistic values of horizontal diffusion can be set at levels close to the top of model under these circumstances.
- A. Dziedzic : "Test of a new snow parametrization in ALADIN"

  The examination of the influence of "Herve Douvile's snow parametrization scheme" with ISBA on model ARPEGE/ALADIN was realized by : running e927 configuration with new scheme, making a weather forecast (config. e001) with and without scheme, making a sensibility test for starting values of snow albedo and density, verification of 2m temperature forecast. The est was made on the meteorological situation of 2nd January 1997.
- H. Haddouch : "On CMAFOC files"
- M. Janousek : "Non-Hydrostatic semi-Lagrangian scheme"

  A study of the two-time-level non-Hydrostatic scheme was carried on. The successful implementation will be particularly important for computational aspects of future high-resolution applications of ALADIN. The results are not conclusive yet. The scheme is still unstable although possible sources of instabilities were already identified.
- A. Marki : "Study of fibrillations and proposal for new anti-fibrillations scheme"

  The operational anti-fibrillation scheme used by ARPEGE model based on the paper of Girard-Delage (1990), modified by J.-F. Geleyn, showed some weakness in damping the undesirable temporal oscillations (called fibrillations) due to used large integration time-step. A new analysis of the coupled system of equations is done and 1-D version of ARPEGE model is used for diagnostics. A new anti-fibrillation scheme is proposed which lessens the number of corrected points (from 80-90% to 5% or so of all points depending on damping parameter) increasing the accuracy of the forecasts, leading to possibility of increasing the time-step of integration and not consuming too much CPU time.
- W. Sadiki : "Various Digital Filters problems"

First, the introduction of a non-Hydrostatic version in initialization scheme was tested. The second problem concerns the 3.5D-Var parametrization.

- M. Szczech : "Soil negative temperature treatment in ALADIN"

  To parametrize freezing and melting of water in the soil, Cg-soil thermal coefficient was changed in neighborhood of triple point. This change proved to be insufficient to obtain a good parametrization.

- J. Vivoda : "Diagnostics of the individual terms of Kuo closure and associated feedback"

  The terms of Kuo's closure were investigated. It was found out that most important term is $\dot{\eta}\frac{\partial q}{\partial \eta}$,

  which has very big value over mountains. Experiments with new Kuo's closure, new entrainment rate, exchange order of stratification and convection were carried out. It has desirable effect. As a good solution seems to be CAPE based closure but best results were obtained with relaxation time 30600 seconds, what is extremely high value (and unexpected). Tuning of CAPE closure is next step of this work.

3. HERA activities in GMAP : Richard Mladek and Jean Barckicke

As previously explained, HERA is a project of systematical intercomparison of forecasts of precipitations in the frame of MAP. The model data fields have been partly received in Toulouse. A pre-processing of the data was necessary to have raw model comparable with the measurements. Using these elaborated data, the procedures to compute global scores and contingency tables are now available. They will be applied to the data of the different models to be compared.

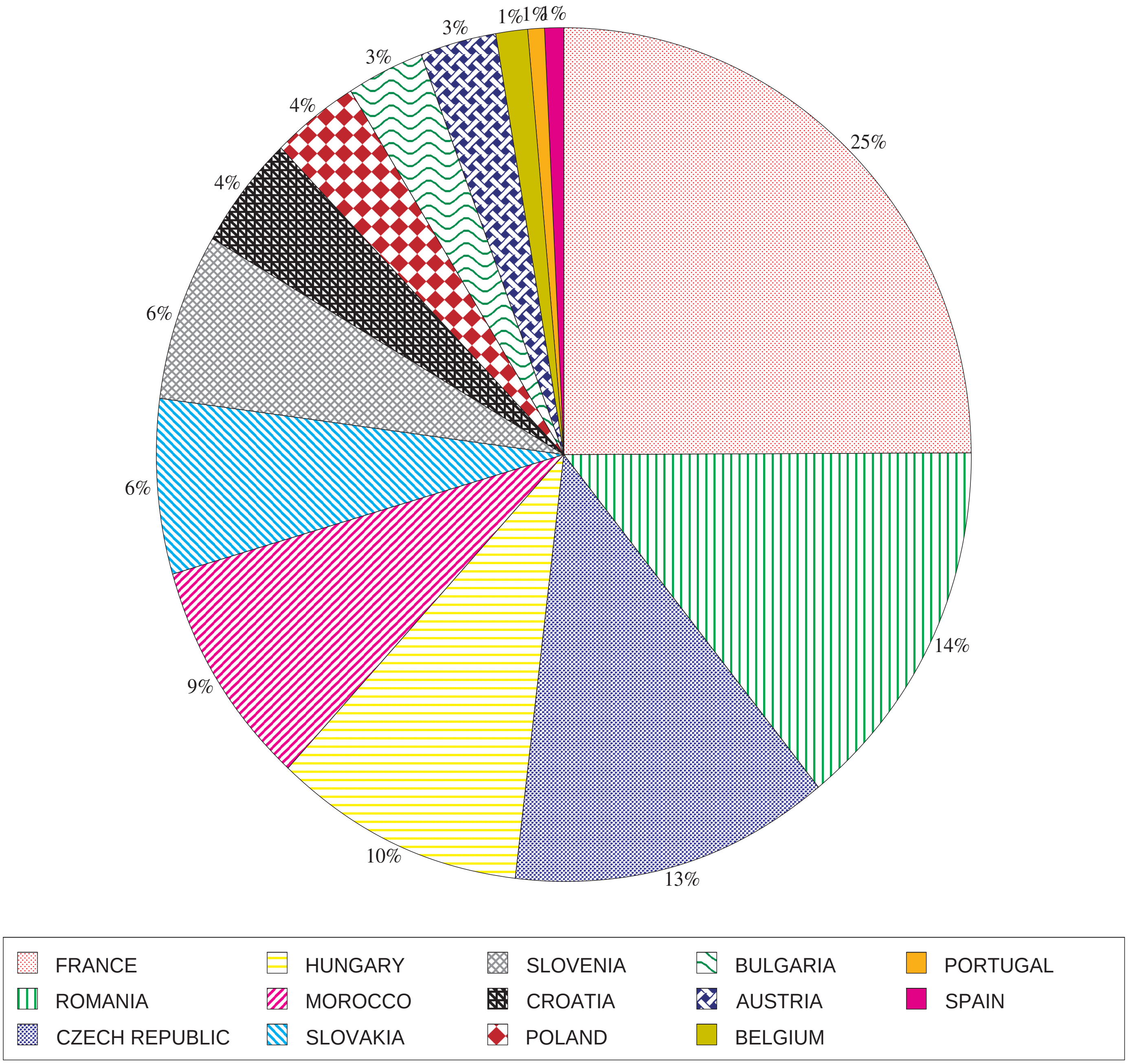
4. RETIC activities in GMAP : Patrick Le Moigne

In the framework of the RETIC (Reseau de Transfert Interne des Connaissances), the action called B95 is now under development. The aim of this action is to prepare a surface wind climatology at fine scale. The automatic classification is the starting point of the study, its result is a repartition of the different weather types into several classes. Then the second phase consists in modelling the different classes, using ALADIN-FRANCE model (mesh size of 12.71 Km). Finally, in the third phase, Meso-NH model, initialized with ALADIN-FRANCE data will simulate surface wind at a resolution of 1 Km. The second phase of the action has just started now, with the simulation of recent cases to compare the results of ALADIN + Meso-NH with observations.

Annexes :

Total Participation in the ALADIN project

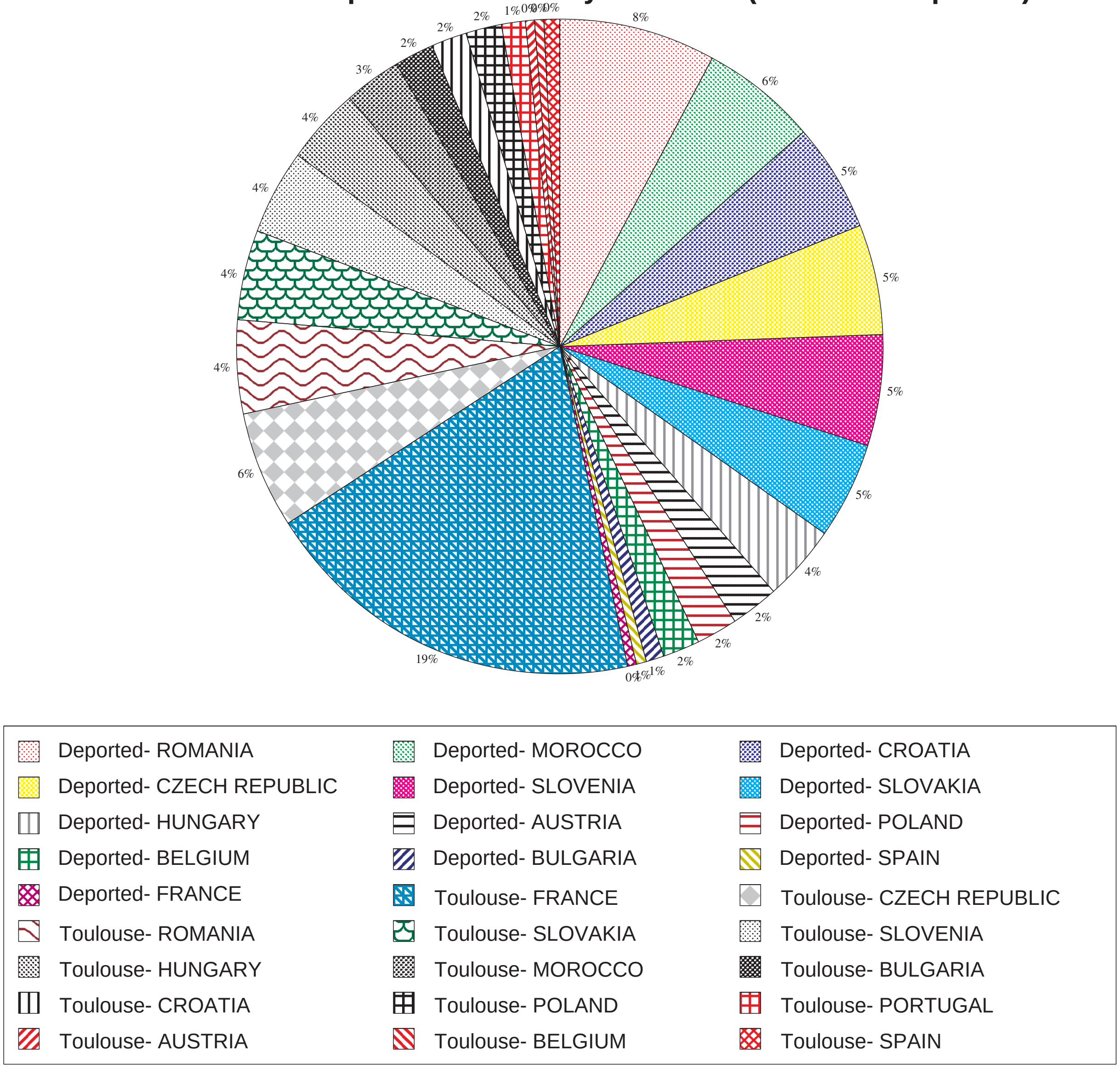
Breakdown of the person.months by countries



Updated on 31-DEC-97 (Toulouse) and 30-SEP-97 (Outside)

Participation in the ALADIN project since the last quarter of 1995

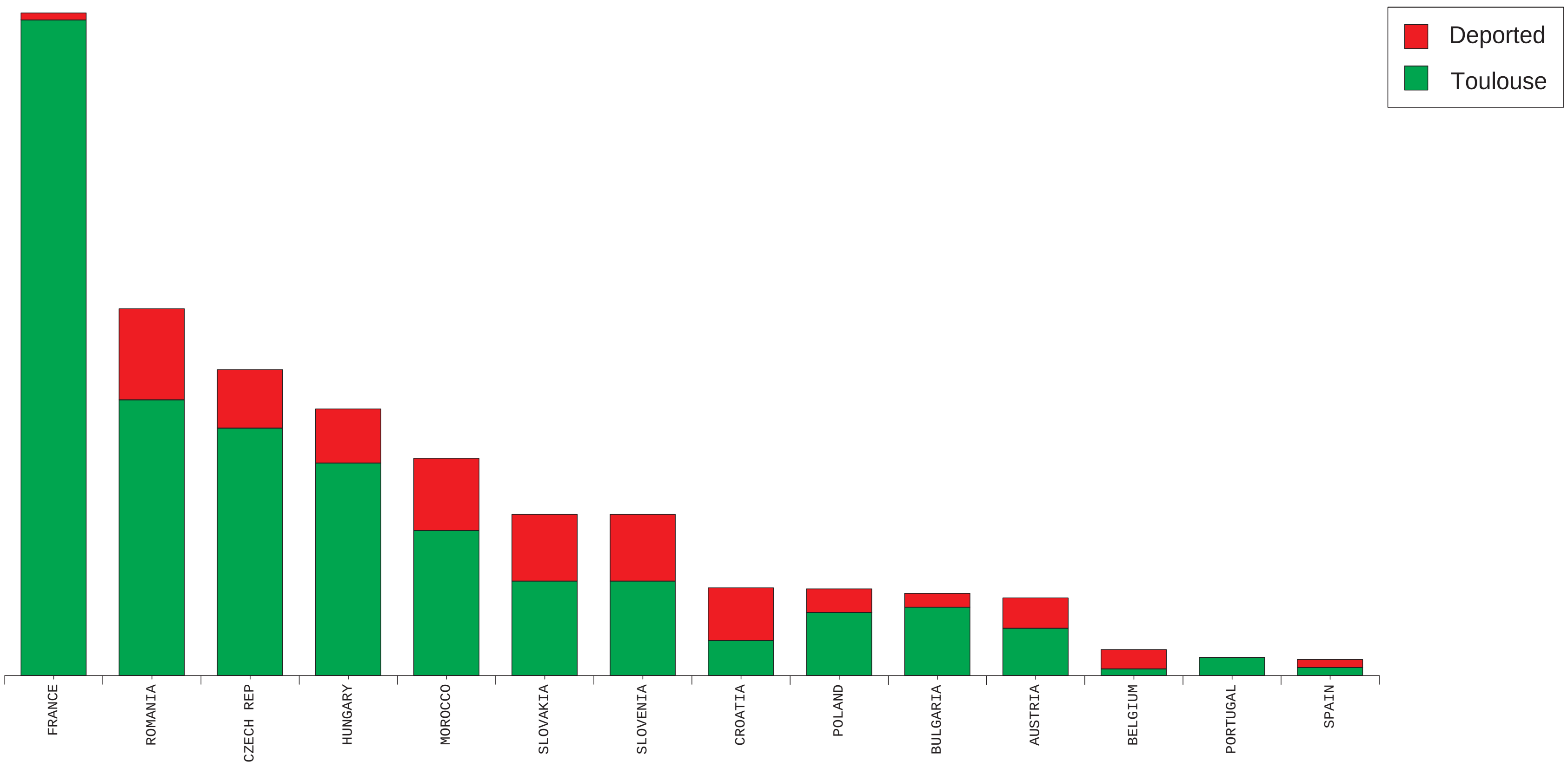
Breakdown of the person.months by countries (Toulouse/Deported)



Between 30-SEP-95 and 30-SEP-97

Total Participation in the ALADIN Project

Breakdown of the person.months by countries



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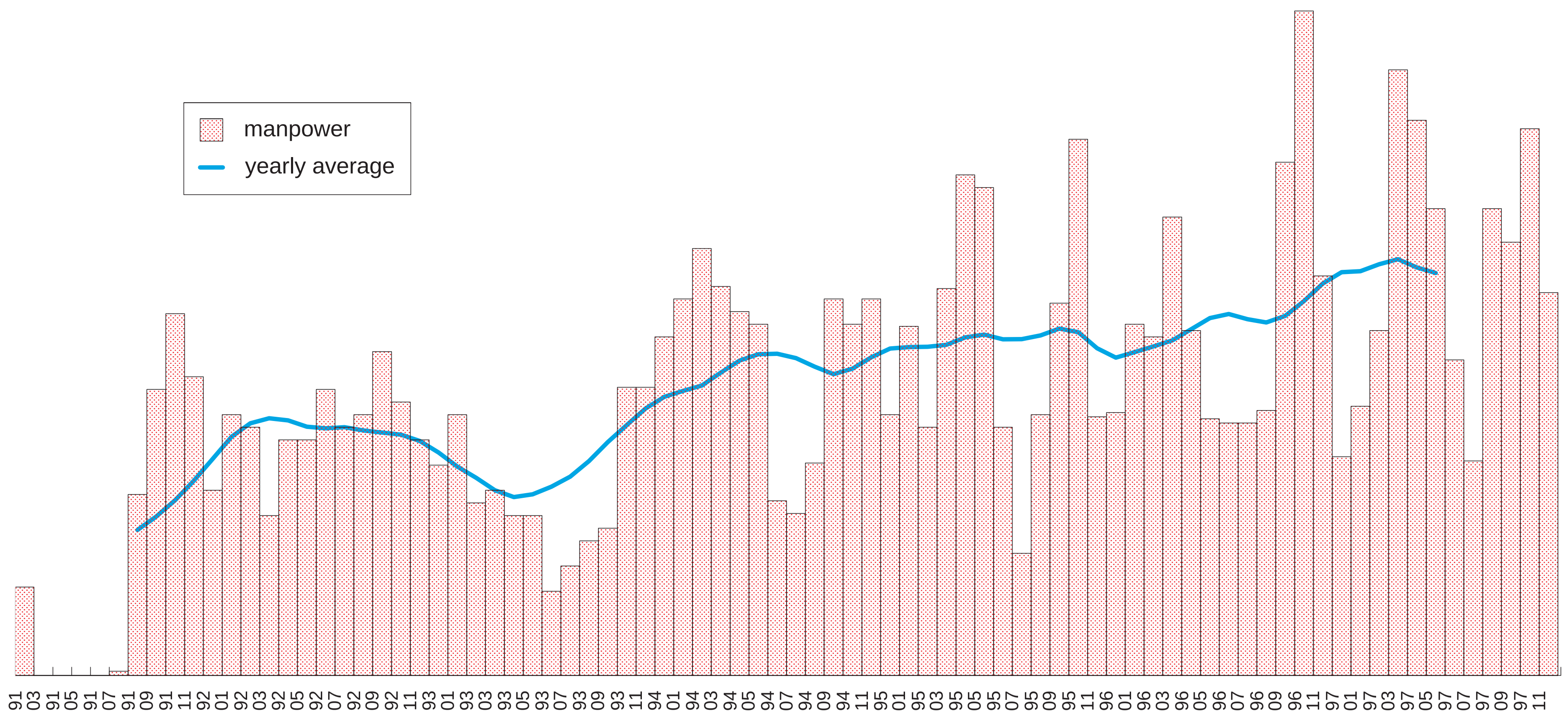
Participation in the Toulouse part of the ALADIN project

Evolution of the monthly manpower



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