Czech Republic Slovenia Croatia France Slovakia Bulgaria Hungary Romania Austria Belgium Morocco Portugal Poland

ALADIN

Newsletter

Number 11 **April 1998 - June 1998**

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 April 1998 and June 1998 (except for the work realized outside Toulouse : between January 1998 and March 1998).

Please do bring to my notice anything that you would like to be mentioned in the next Newsletter (number 12) before the 15th of October 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.

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

Contents

Main events

1. ALADIN-LACE switch in Praha : a report live from Radmila Bubnova

ALADIN/LACE quits Toulouse and and starts its new stage in Prague.

The operational switch of ALADIN/LACE from the computer Cray J916/12 in Toulouse to the RC LACE Computing Center in Prague equiped by NEC SX4/3A went smoothly on 20 June 1998 for 12 UTC run. The operational suite in Toulouse was stopped the following day, the last run took place for data from 21 July 1998 00 UTC.

The switch took place after only three weeks of parallel test runs in Prague and Toulouse, due to the late delivery of telecommunication lines. Therefore some 'teething' problems are unavoidable, at least till the end of summer.

The porting library cycle was the one with the label AL08T3/CY18T3, so the same on both Cray and NEC machines, the model configuration was kept also the same for the porting.

The available products from ALADIN/LACE were nearly all kept except the obsolete coarse resolution lat/lon Prague II list, so their resume is as follows:

- surface fluxes with output frequency of 3 hours;
- Emde list of 45 upper air 'urgent' fields every 6 hours;
- Emde list of 47 upper-air 'non urgent' fields every 6 hours;
- pseudo-TEMP messages computed every 3 hour sent by email;
- 'movie' pseudo-satellite file;
- 22 RETIM I charts;

- individual national subdomain coupling files available from ftp server by internet with 6 hour frequency;
- raw data (every 6 hour raw data are sent for archiving).

Additionally, the envelope coupling files are despatched to the Members via TelArc, with frequency of 6 hours, which provides more stable conditions for national applications of ALADIN in Member countries.

Concerning the new telecommunication backbone by IBM GN, the lines are going to be hopefully stabilised but some perturbations cannot be still excluded. Under good telecommunication conditions, the ALADIN/LACE suite is finished on NEC a half an hour earlier than on Cray in Toulouse. But with the planned increase of resolution in September the timings will change.

The excellent job on the operational switch has been done by teams in Prague and in Vienna.

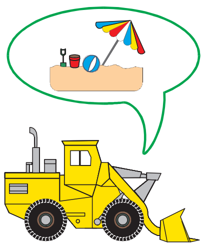
The structure of RC LACE personnel has been changed as well, the so-called Toulouse Team has been replaced by the Prague Team, the Management Group has got also reorganised and so on. More about RC LACE can be found on the http address *www.chmi.cz/meteo/ov/lace* once some time is found to update these web pages.

2. *Moldavia participation*

Last April, the Hydrometeo Service of the Republic of Moldavia decided to participate to the ALADIN project jointly with the colleagues from Romania. In order to take advantages of the experience of the Romanian team of working under ALADIN project, two Moldavian colleagues have been directed to Bucarest for probation. Moldavia will appear in ALADIN statistics next quarter (statistics updated at the end of September including deported work updated at the end of June).

3. *Modifications for the operationally running ALADIN configurations*

In order to better use the resources of the Fujitsu VPP in Toulouse, ARPEGE resolution will change soon (probably late August) : T199 (instead of T149), 31 levels (instead of 27), smaller mesh-size at the central point (19.1 km instead of 25.4). At the same time, the size of the ALADIN-FRANCE domain will be increased and its grid mesh will decrease from 12.7 to 9.9 km.



One of these changes will have an impact on the operationally running deported ALADIN models (depending on the configurations : coupling with ARPEGE or ALADIN-FRANCE files). Different alternatives could be chosen to face these changes, with more of less work to be realized in Toulouse and in every operationally working ALADIN partners.

Summer holiday will hence be study holiday for unfortunate ALADIN contact points for operational or pre-operational applications and the affected members of the Toulouse team.

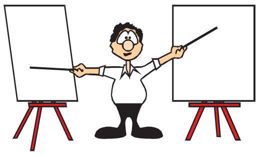
Conferences/Workshops/Announcements

1. ALADIN Workshop on "Exploitation and future development of the NWP model ALADIN" held at in Prague on June 10-12th, 1998 : a report from the workshop organizer, Martin Janousek

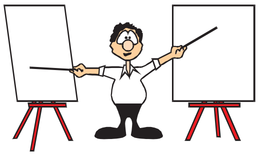
The fifth ALADIN workshop with the title "Exploitation and future development of the numerical weather prediction model ALADIN" was held at CHMI in Prague on 10 - 12 June 1998.

It had been already a kind of tradition to gather forecasters and modellers at the beginning of summer so that they can present their work in applications of ALADIN in the forecasting practice and exchange experience earned from the model use and special case studies. This year this basic aim was extended by the need to discuss the second long-term scientific plan for ALADIN. The composition of participants and the topics of talks and discussions therefore covered rather equally the development, operational and exploitation activities of the ALADIN community.

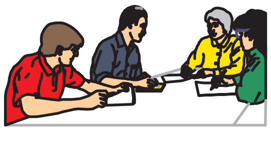
In the course of three days, 32 participants from 11 countries gave 28 talks. There were two principal round-table discussions on the model verification and subjective evaluation and on the long-range scientific plan.



- Very much attention was given to the verification issues of the model results. The concepts and expectations sometimes differ country by country which is logical due to different applications and roles of ALADIN in weather services. However, in spite of that differences and difficulties of unification the general conclusions on the model quality and behaviour were quite coherent and also instructional for modellers which justified the further exchange of such verifications and subjective validations in future.



- Very interesting presentations were given on the various model applications in the weather services. It was very interesting to see how the model was intensively used in the forecasting practice. The model results were even used straight in products customised for special users or underwent further statistical adaptation with the aim to improve their correctness and reliability.

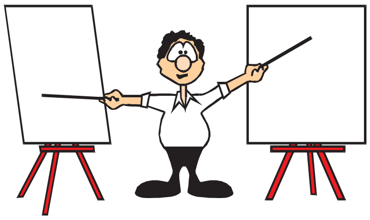


- In the discussion on the long-range scientific plan it was noticed that transparency of project ant its tasks had improved, which was found to be important for personal involvement of people in the team and the growth of their feeling of responsibility. The latter held for leading people in national environments which made the decisions about the use of available resources. The leadership of the project was therefore encouraged to proceed also in direction of compact and simplified description and presentation of structure of the project and its tasks, their benefits and resulting priorities.

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

2. *ALADIN Mini-Workshop on "Data Assimilation" held in Toulouse on June 8-12th, 1998 : a report from our sports reporter Claude Fischer*

The week of June 8th was marked by two highlights at GMAP. Firstly, the 16th football world cup started on Wednesday, 10th. Secondly, a mini session on data assimilation in ALADIN was held in Toulouse.



On Monday, the participants presented recent works and projects :

- Dominique Giard presented the CANARI applications on surface fields with the new ISBA scheme (a work carried out by Meriem Zitouni). Meriem implemented the possibility for only performing the surface analysis. She then compared simulations with 3D analysis, surface analysis only and dynamical adaptation. The data and the quality control were taken as in ARPEGE with no tuning for ALADIN. No improvement was obtained with the two types of analysis, compared to the dynamical adaptation. This shows that extra mesoscale data is needed to retrieve the potential improvement of the CANARI analysis.

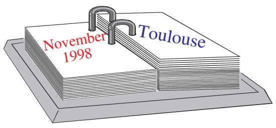
- Radi Ajjaji described the operational implementation of CANARI in Morocco. The Moroccans now have a very precious and somewhat unique experience with the optimal interpolation scheme in an operational design.

- Maria Monteiro and Maria Siroka showed their latest results for the preparation of a 3D-VAR scheme in ALADIN. M. Monteiro showed that the forecast error covariances on the LACE domain behave very much like those of the France domain (L. Berre's work). Thus, we might in future expect a similar behavior of the 3D-VAR on different ALADIN domains. M. Siroka worked on the implementation of the new, non-separable, multi-variate covariances in ALADIN. The development of the variational code is still in progress.

- Cornel Soci presented first results on the gradient computations (conf 801) and Claude Fischer showed plans for the singular vector computation (conf 601). Note that these tools might allow in the future to test the impact of lateral boundary conditions or simplified physics. However, in the near future, these configurations will be strangled by the fact that the TL and the AD of ALADIN only work in mono-processor mode on the VPP.

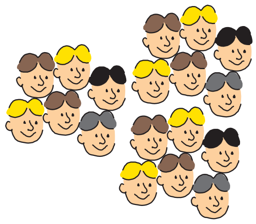
- Marta Janiskova showed her results on the use of her simplified physics in the ARPEGE 4D-VAR, on FASTEX cases. Positive impacts are obtained on the location and the deepening of the surface low of IOP 17. This work will be part of Marta's PhD defense in November, for which we all cross fingers !

- Gregor Gregoric came to GMAP to investigate the possibility of using CANARI to produce a routine data analysis. Thus, he got more familiar with CANARI and could discuss on the technical issues for an operational use.



Another meeting is scheduled for early November in Toulouse. It will focus on the coordination of further developments in optimal interpolation.

3. EWGLAM/SRNWP meetings to be held in Copenhagen on October 5-9th, 1998

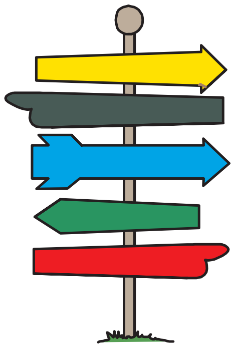


Organized by the Danish Meteorological Institute, the next combined EWGLAM/SRNWP meetings will take place in Copenhagen. The special topic of these meetings will be "Experiences with very high resolution models using a grid point distance below 10 km".

4. Third Assembly of the ALADIN Partners to be held in Praha in November

During the Second Assembly of the ALADIN Partners in Brussels last December, Dr. I. Obrusnik has invited ALADIN Partners for a third assembly in Praha (Czech Republic) in the beginning of November 1998.

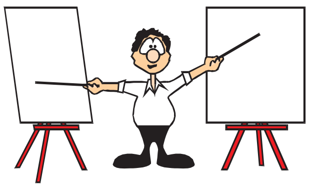
Some of topics of this Assembly will be :



- assessment of 1998 global research and development program,
- discussion on the 1999 global research and development program,
- expression of the 1999 ALADIN Partners commitments,
- proposed amendments to the MoU, in particular in relation with the potential software agreement with ECMWF,
- discussion of the three years scientific plan,
- ...

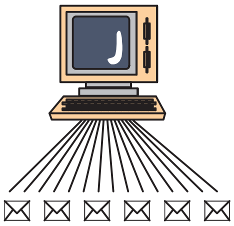
5. "Atelier de Modélisation de l'Atmosphère" (A.M.A.) to be held in Toulouse on December 8-10th, 1998

This year, the main topics of the A.M.A. will be "Modélisation de la convection" and "Modélisation de la cryosphere". A "call for contributions" has been sent within the French speakers community (communications and posters will be in French) and is available on the usual ftp-public (see below). More details on request by writing at : ama98@meteo.fr.



Contacts & Informations

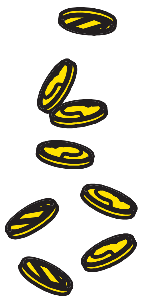
These informations (and others, please see the list of the documents in annex) are available on a public ftp : ***cnrm-ftp.meteo.fr***, under the directory ***/pub-aladin***. Please connect on user anonymous and use you e-mail address as your password.



Some mailing lists also exist to make our correspondence smoother; 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 last part of the funding from the ALADIN-KIT will be used for financing participations to the EWGLAM/SRNWP in Copenhagen (October 1998). The arrangement is similar to the arrangement during the EWGLAM 97 meeting. The Meteorological Services entitled for receiving the KIT funding have indicated their representative for this meeting. For more details, please contact dominique.giard@meteo.fr.

2. Embassies support

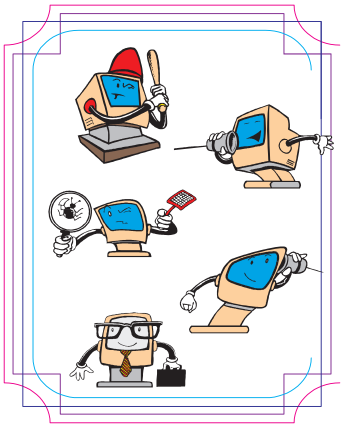
For 1998 funding, new rules have been prescribed for the use of embassy support : money should have been available early in the year (i.e. August or September !...) without possibility of report during the first months of the following year. More details can be asked to Arlette Rigaud (Météo-France/DGS/IE, arlette.rigaud@meteo.fr).

As a consequence, most of these stays have been planned between September and December and... the new phasing will also take place during this period. Then, more than 35 ALADIN visitors will be present in Toulouse during these few months.

The (pre-) operational ALADIN models

Following Martin's suggestion, we will merge reports about the (pre-)operational ALADIN models on big computers and on workstations as the division between these two sorts of computer became a bit artificial nowadays.

1. *The AWOC-group*



2. *Workstation version at Austrian Meteorological Service*

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

For ALADIN-VIENNA, the model status has not changed much this quarter : problems to get error-free ee927 and 001 runs under way are about to be solved. ALADIN-VIENNA will run on a quasi-operational basis very soon now.

3. *The operational implementation of ALADIN-Belgium*

(more details luc.gerard@oma.be)

4. *Workstation version at Bulgarian Meteorological Service*

(more details andrey.bogatchev@meteo.bg)

Successful implementation of ALADIN 08, and ALADIN 08t3 + bugfix on IBM R6000 workstation. There were some problems related with XR08, but they were solved. Successful runs of EE927 and 001 configurations. Preparation of pre-operational chain.

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

(more details bruno.lacroix@meteo.fr)

The visualization of ALADIN on SYNERGIE has been adapted to the needs of both forecasters in Toulouse and in the French regional meteorological centres.

The ALADIN-FRANCE model is running operationaly on the Fujitsu VPP700 since 29th June.

A new ALADIN version (10km, 31 levels) is tested on a parallel suite, coupled with ARPEGE 199C3.5L31, with a bigger domain and with the same center point as in the original configuration (i.e. before the extension for Portugal). This new configuration will replace the actual one at the end of August ... in case of success.

6. Workstation version at French Meteorological Service

(more details jean-marc.audoin@meteo.fr)

On the workstation (Model server Enterprise, processor Ultra Sparc 300 MHz, memory 512 MO) with the Fujitsu Fortan 9O, the configurations ee927, 001 and Fpos (outline) of the export Package Al8t3 has been tested.

Any optimization has been yet undertaken, so for instance : to run a configuration Fpos on the domain France-Portugal (200*200 points, 27 vertical levels), with the similar conditions to the operational VPP, the time must be about 2/3 minutes.

To transform the Fpos files (domain lat/lon) to GRIB files, to visualize the produced files for instance by Metview, the operational routines "progrid" has been implemented, as also the library emos(gribex/pbio, Version 13.) and the scripts and routines import_fa (to transform File CRAY to File IEEE) .

7. Workstation version at Hungarian Meteorological Service

(more details horanyi@met.hu)

As it was reported in the last Newsletter the ALADIN model became quasi-operational during the first quarter of 1998. Since that time the model was running in a reliable manner, mostly encountering only difficulties around the transfer of initial and lateral boundary files. Nevertheless the archives for these input files is always kept continuous having the possibility for past case studies.

Systematic comparison of ALADIN/LACE and ALADIN/HU model was carried out and the outcomes were presented in the last ALADIN workshop held in Prague. There were problems found on the forecasts of the 2m temperature, for the other fields the two models gave similar results (for more details see the soon appearing proceedings of the ALADIN workshop).

Some additional software was implemented in the last period, like Vis5d for scientific visualization, the pseudo-satellite images were put into the visualization system (permitting the possible superposition of it with any other analyses or forecasted fields) and now also more HRID cross sections are produced.

Some progress was also achieved regarding the objective verification of the ALADIN/HU model, however it is not yet put into operations.

For the near future it is planned to switch to the initial and boundary files coming from Prague. It is expected to be more reliable than the transfer from Toulouse, because it will be carried out on IBM GN lines through Vienna, therefore it is hoped that availability rate of the model will be increased as well.

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

(more details bubnova@chmi.cz)

9. ALADIN-LACE in CHMI

(more details : janousek@chmi.cz)

10. Operational ALADIN-MAROC in MAROC-Météo

(more details mehdi.elabed@meteo.ma)

11. Workstation version at Polish Meteorological Service

(more details zijerczy@cyf-kr.edu.pl)

12. Workstation version at the Portuguese Meteorological Service

(more details mario.almeida@meteo.pt)

The version AL08T3 of ALADIN is now running on the DECAlpha Unix V4.0.

Climatological files (ISBA) have been computed for Portuguese domain.

A post-processing of 10 meters wind field and a dynamical adaptation (following Mark Zagar's work, see Newsletter 10, Slovenia) have been developed.

Thanks to new procedures, CMAFOC files for OI/CANARI are created using BUFR expansion. Some routines for OULAN/BATOR have been adapted to the home pre-processing environment (for TEMPs and surface observations).

The new link Toulouse-Lisbonne (GTS and TCP/IP) is planned for the end of September. Meanwhile, pre-operational runs of ALADIN are waiting for access to coupling files via FTP/internet.

13. Workstation version at the Romanian Meteorological Service)

(more details dragulanescu@meteo.inmh.ro)

14. Workstation version at Slovak Meteorological Service

(more details ol@shmuvax.shmu.sk)

15. Workstation version at Slovenian Meteorological Service

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

‘‘Réseau Formation Recherche’’ : PhD Studies

- Doina BANCIU : report in the next Newsletter.
- Marta JANISKOVA : "Realization of a simplified physical parametrization for incremental four-dimensional variational data assimilation"

The manuscript of the thesis with the title "Realization of a simplified physical parametrization for incremental four-dimensional variational data assimilation" has been completed. The thesis contains the description of the proposed simplified physical parametrization, validation of the simplified direct physical package, the description of incremental four-dimensional assimilation system and its tangent-linear and adjoint models, linear evolution of the simplified physical parametrization and 4D-Var assimilation experiments.

In the last period of my PhD study, some experiments have been performed using the simplified physical parametrization schemes (vertical diffusion, gravity wave drag, stratiform precipitation, convection and radiation) in an incremental 4D-Var assimilation with the global forecast model ARPEGE. FASTEX situations have been selected as test cases.

To evaluate the gain obtained when using physics in a 4D-Var system, the experiments were performed also with 3D-Var and 4D-Var assimilations using an adiabatic model. The results were evaluated in terms of fit of the analysis to the observations. They were then also evaluated in terms of forecasts and compared with the operational forecast at the time of FASTEX when an optimal interpolation (OI) was used. The forecasts have been performed up to 72 hours starting from the initial state using 24-hour (4 times 6-hour) assimilation cycle for IOP3 (assimilation from 13/1/97 to 14/1/97), IOP9 (assimilation from 31/1/97 to 1/2/97), IOP17 (assimilation from 17/2/97 to 18/2/97) and compared with the operational OI analysis.

For a more objective evaluation of the quality and the stability of the assimilation systems, one of the experiments starting from 13 January 1997 was prolonged to 20 January 1997. One week assimilation cycles were done using 3D-Var, 4D-Var adiabatic and 4D-Var with the whole set of simplified physical parametrizations. The forecasts were performed up to 72 hours twice a day, from 00UTC and 12UTC. The range of 72-hour forecasts in 12-hour intervals were verified against the OI analysis and some comparisons have been done as well again observations. The fit of the initial conditions (first guess) to the observations for the whole period was evaluated as well.

The results from case studies IOP3 and IOP17 have shown that using 4D-Var leads to correcting the cyclone location (compared to OI and 3D-Var). Including the physics in 4D-Var usually helps to improve the position of the cyclone as well as the value of the low. 4D-Var seems to have sometimes a tendency to deepen the depression excessively.

The verification of the forecasts or the initial conditions of the model integration against observations showed, that 4D-Var with physics performs for most of the cases better than 3D-Var or adiabatic 4D-Var. More deficiencies when using the physics in 4D-Var were observed for 4D-Var with the whole set of the simplified physics rather than with the reduced set (vertical diffusion, stratiform precipitation and gravity wave drag). This points out to likely deficiencies in the convection and radiation schemes and will still require a deeper investigation.

The results issued from a one-week assimilation cycle, according the verification of the forecasts and the initial state against observations, indicates some improvement in the case of 4D-Var, but there are slight differences when using adiabatic 4D-Var and 4D-Var with the simplified physics. Generally the impact of the physics used in 4D-Var is weak. One of the reasons may be the short assimilation window (6 hours). Future experiments should be done in order to study if the effects of physics become really more important as the duration of the assimilation window is longer.

The advantage of including the physics in 4D-Var should be the possibility to use some additional data related to the model physics (cloudiness, precipitation data, liquid water contents). In our experiments we used the same observations for each of the used assimilation systems. Using more observations in 4D-Var with simplified physics, especially more information about humidity in the tropics, is desirable for data assimilation process and it can also enlarge the differences compared with an adiabatic 4D-Var system. This possibility should be investigated in the future.

At the beginning of this study one could not be sure if including the physics in 4D-Var will not be more harmful than profitable for assimilation system due to the discontinuities present in the physical processes. Despite the investigations which are still necessary for improving a 4D-Var system with simplified physics, it seems that the combination of the incremental method and the inclusion of the simplified and regular physics in the assimilating model is the way to improve this new four-dimensional dynamical data assimilation system.

- Ilian GOSPODINOV : "Conservation Properties of 2 Time Level semi-Lagrangian"

The research activities of this study have been extended to stability and accuracy of different 2TL SL schemes. A new scheme has been developed on the base of a one dimensional spectral semi-Implicit two- time-level semi-Lagrangian "Shallow Water" model. The conventional (using linear extrapolation in time) scheme, our new scheme as well as other recently developed schemes have been examined with respect to momentum, mass and total mechanic energy conservation. The new scheme showed very robust conservation ability while the other schemes performed rather poor. No significant problems with respect to accuracy have been detected, although further study in this sense has to be carried out. The new scheme has been successfully implemented in the 3 dimensional LAM ALADIN. Its implementation in the momentum equation required a split into two parts - semi-Lagrangian trajectory scheme and construction of the RHS. The second part lad to a new treatment of the orographic forcing terms in the case of eta vertical coordinate. Presently a new discrete form of the continuity and temperature prognostic equation is being examined.

- Filip VANA : "Dissipative processes in the semi-Lagrangian version of ALADIN"

Nothing new from the last time from the scientific point of view. From the technical point of view some work which will enable to compute all necessary jobs on Prague NEC supercomputer has been done.

- Mark ZAGAR : "Realization of a simplified, differentiable and realistic physical parametrization for incremental four-dimensional variational data assimilation"

During the last period the basic configuration 001 of ALADIN has been forced to work in quasi 1D mode while dynamic large scale forcing has been retained through advection terms of momentum equation. Experiments have been performed which were aiming towards better vertical representation of atmospherical structure due to increased number of vertical levels (typically up to 61 levels) especially in cases when a signature of shallow inversion layer was present in the sounding but not in the forecast of ALADIN/LACE, for example. Untill the present moment success has been limited. Another issue in high vertical resolution modelling is the investigation of 1D response to low-level forcing by the dynamically adapted wind field. For this high horisontal resolution modelling has been applied for the heavy precipitation case at Vaison-la- Romaine on September 22 1992 in order to prepare some target results.

Scores on ALADIN-FRANCE during the second quarter of 1998

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

1. *The event of the quarter*

The ALADIN model is running on the fujitsu vpp700e since 29th June (ARPEGE too of course).

2. *Comments of classical scores against SYNOP*

The scores (bias and root mean squared error) plotted on the next figure correspond to the scores calculated against surface observations SYNOP over the domain ALADIN-FRANCE. Scores are averaged over the second three months of 1998, for each 6 hours time step.

We use about 200 synoptic stations over the domain.

COMMENTS:

MSLP :
The RMS rises with time range from 0.65 to 1.44 hPa. For the bias there are two phenomena :

* a diurnal cycle

* a decrease with time range

CORRECTED TEMPERATURE
Bias shows an overestimation on afternoon (forecast range 12 and 36 hours) and an underestimation at night and evening. The RMS is about 2° with a diurnal cycle amplitude of about 1°.

PRECIPITATIONS
There is a small overestimation, especially on afternoon (forecast range 12 and 36 hours).

CLOUDINESS
The RMS is high, and remains quite constant with forecast range (from 28.8 to 33.2%). The bias shows an underestimation .

For cloud cover and precipitation contingency table approach is better (see next page).

WIND DIRECTION

The RMS of wind direction is large (40 °) and constant.

WIND INTENSITY
The RMS doesn't vary so much. The bias shows always an underestimation, especially on afternoon.

HUMIDITY
There is a diurnal cycle of the error of the RMS (amplitude about 8%) and an underestimation of humidity (bias negative)

METEO-FRANCE, SCEM/Previ/Compas
Model performance PLAD1

AERA=FRANP01
SYNOPs comparison
01/04/1998 -> 30/06/1998
UTC initial data set00H

PMER = MSLP (hPa)
TCOR = CORR. TEMPERATURE (K)
RR = PRECIPITATIONS (mm)
NEBT = NEBULOSITY (%)
DD = WIND DIRECTION (Dg)
FF = WIND FORCE (m/s)
HU = HUMIDITY (%)

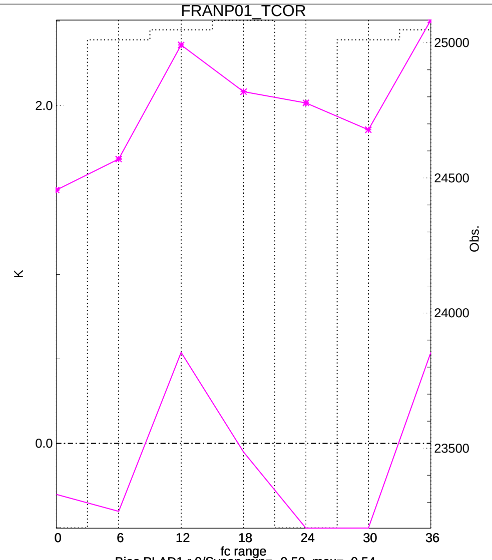
Bias PLAD1.r 0/Synop

Rms PLAD1.r 0/Synop

FRANP01_PMER

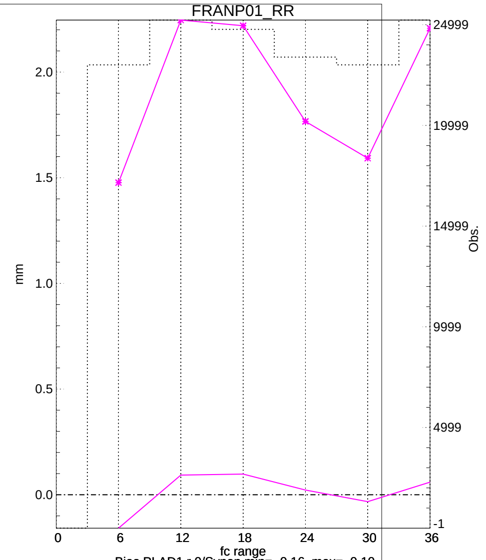
Bias PLAD1.r 0/Synop min= -0.21, max= 0.31
Rms PLAD1.r 0/Synop min= 0.65, max= 1.44

FRANP01_TCOR



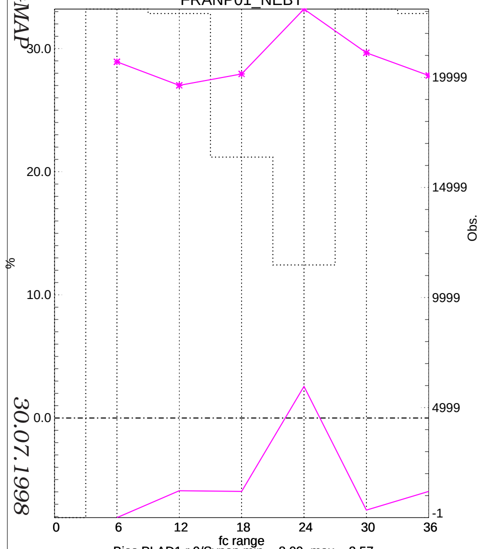
Bias PLAD1.r 0/Synop min= -0.50, max= 0.54
Rms PLAD1.r 0/Synop min= 1.50, max= 2.51

FRANP01_RR



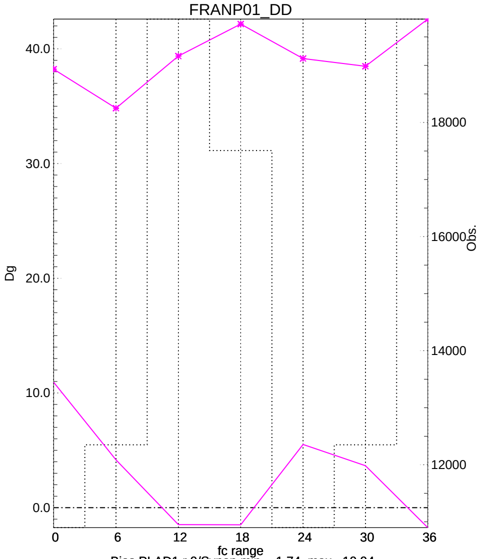
Bias PLAD1.r 0/Synop min= -0.16, max= 0.10
Rms PLAD1.r 0/Synop min= 1.48, max= 2.25

FRANP01_NEBT



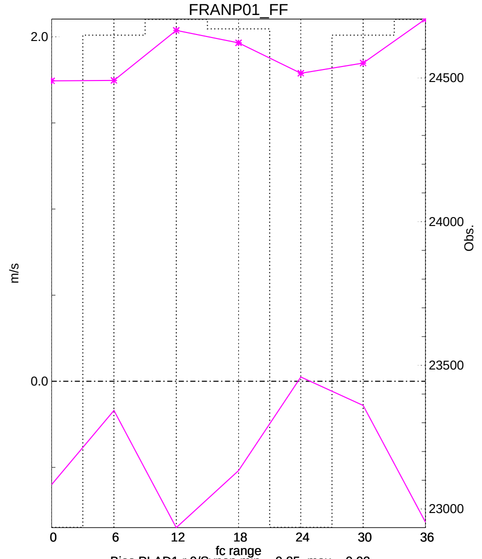
Bias PLAD1.r 0/Synop min= -8.09, max= 2.57
Rms PLAD1.r 0/Synop min= 27.01, max= 33.21

FRANP01_DD



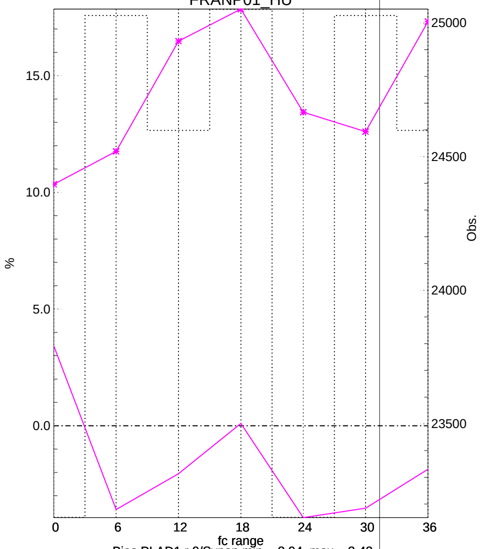
Bias PLAD1.r 0/Synop min= -1.74, max= 10.94
Rms PLAD1.r 0/Synop min= 34.83, max= 42.60

FRANP01_FF



Bias PLAD1.r 0/Synop min= -0.85, max= 0.02
Rms PLAD1.r 0/Synop min= 1.74, max= 2.10

FRANP01_HU



Bias PLAD1.r 0/Synop min= -3.94, max= 3.42
Rms PLAD1.r 0/Synop min= 10.35, max= 17.85

3. *Comments of contingency table*

Next tables are the cloud cover and precipitation contingency tables for the maximum forecast range of ALADIN-FRANCE model : 36 hours. Classes are used the verification of NWP models in EUROPE (EWGLAM).

Three skill scores have been calculated over the whole table :

* CORRECT : percentage of good forecast
* HEIDKE : score against hazardous forecast
* ROUSSEAU : the more severe, score against hazardous forecast which respect of climatology of phenomenon.

Contingency tables for precipitation should be computed with classes :

$P < 0.1$ mm, $0.1 \leq P < 0.2$, $2.0 \leq P < 10$ mm and $P \geq 10$ mm (per 6 hours).

In this contingency table, the blue color means an underestimation, the red one represents an overestimation.

<u>CLOUDINESS</u>

The percent of correct is 52%. The high nebulosity class (7-8) is more observed than forecasted : 40 against 26% . The difference stays in low and medium nebulosity class.

9804-9806		CLOUD COVER			
	MODEL :	ALADIN		00 H start	
	AREA :	FRANP01-Franp01		Step36 H	
91 days					
		Forecast			
		0 - 2	3 - 6	7 - 8	SUM
Obs.	0 - 2	**11.0%**	6.6%	0.3%	17.9%
	3 - 6	10.3%	**23.2%**	8.1%	41.5%
	7 - 8	2.6%	20.1%	**17.8%**	40.6%
	SUM	23.9%	49.9%	26.1%	17233
Correct :51.9%		**Rousseau :0.24**		**Heidke :0.25**	

<u>PRECIPITATIONS</u>

The percent of correct is almost 70%. "Light precipitation" class have been more forecasted than observed : 27 against 13%. It is the opposite for "no rain" class : 63 again 76%. Climatology of heavy and moderate rain is quite good.

9804-9806		PRECIPITATIONS				
	MODEL :	ALADIN		00 H start		
	AREA :	FRANP01-Franp01		Step36 H		
91 days						
		Forecast				
		NO rain	LIGHT	MODERATE	HEAVY	SUM
Obs.	NO rain	**58.8%**	15.8%	2.0%	0.1%	76.7%
	LIGHT	3.3%	**7.4%**	2.8%	0.1%	13.5%
	MODERATE	0.9%	4.1%	**3.1%**	0.4%	8.5%
	HEAVY	0.1%	0.3%	0.6%	**0.2%**	1.2%
	SUM	63.0%	27.6%	8.5%	0.9%	19009
Correct :69.5%		**Rousseau :0.34**			**Heidke :0.35**	

4. *Comments of scores against TEMP*

GEOPOTENTIAL

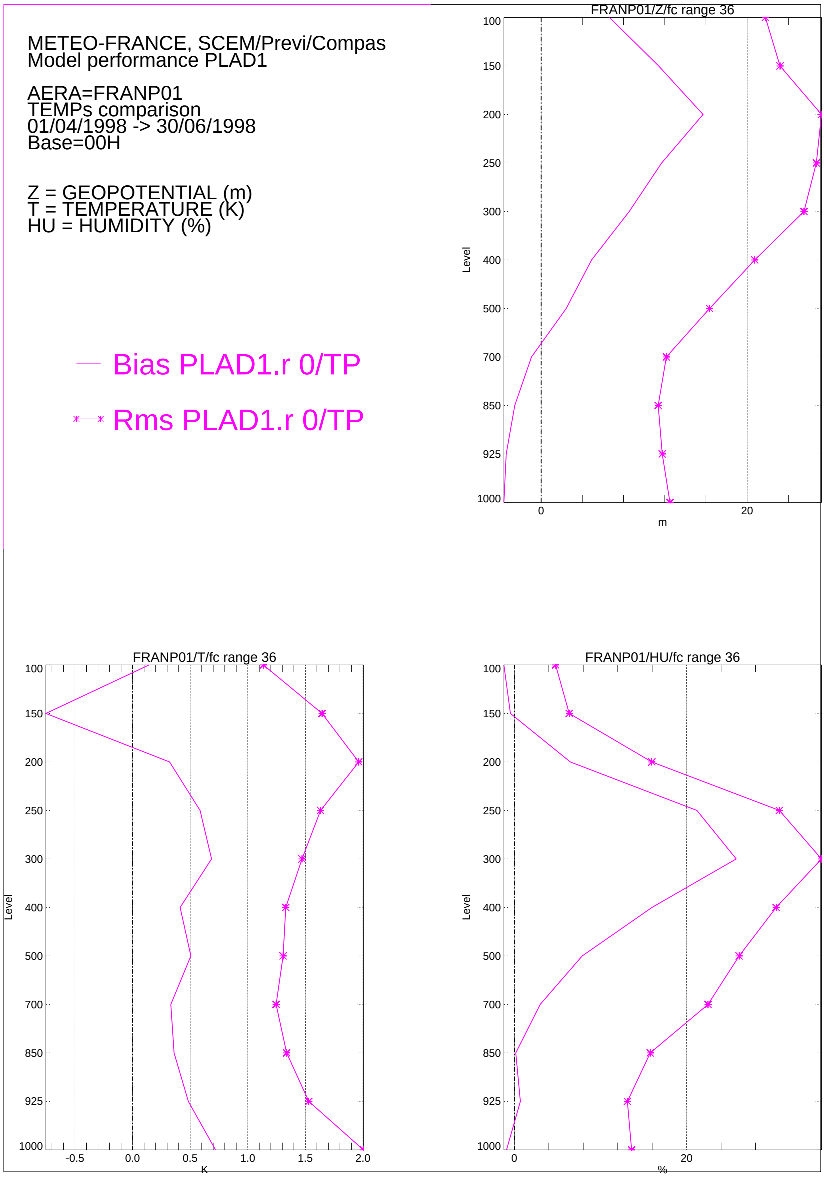
Bias shows an underestimation for the 700 hPa level and an overestimation above 700 hPa. RMS increases from 700 hPa to 200 hPa, decreases over 200 hPa.

TEMPERATURE

Bias is positive in the troposphere negative higher. RMS is maximum at low level and at the tropopause and varies from 1.2 to 2°.

HUMIDITY

The bias shows an overestimation except first low layers. The RMS increases up to 300 hPa.

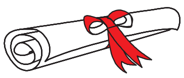


Participations in the ALADIN project

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 first quarter of 1998" and "ALADIN developments in Toulouse during the second quarter of 1998"), 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 suites, work on data assimilation, ... during the quarters concerned by this Newsletter. The following informations concerning the deported developments are obtained from informations you sent.

- The 150th participant in ALADIN project will soon join us and the 1500th person.month will also be reached during the next quarter. Old ALADINers have no chance of obtaining the title of the "150th participant" but stand a good chance of doing the 1500th step ... Stay to work on ALADIN this summer !...



Deported developments during the first quarter of 1998

During this quarter, about 70 persons have worked on ALADIN "at home" (i.e. in their NMS : not in Toulouse) and their global effort represents more about 70 people.month during this period.

1. In Austria

- Implementation of ALADIN/VIENNA (T. Haiden, Y. Wang)
- Verification (Y. Wang).

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)
- Statistical verification (B. Schenk)
- CANARI assimilation (O. Latinne).

3. *In Bulgaria*

- nothing realized in Sofia during this quarter.

4. *In Croatia*

- nothing realized in Zagreb during this quarter.

5. *In Czech Republic*

- Objective verifications of ALADIN (Z. Huthova, D. Hlubinka)
- Subjective evaluation of ALADIN forecasts (M. Ostrcilova)
- Development of supplementary software (D. Dvorak, R. Mladek), porting of supplementary software (M. Janousek, J. Sokolova)
- Installation of ALADIN on NEC SX4 (R. Bubnova, M. Janousek)
- Development of the operational suite (M. Janousek).

6. *In Hungary*

- Preparation of the workstation version of ALADIN for Hungary : adaptation, operational scripts, special post-processed outputs (pseudo-TEMPs, point forecasts, pseudo-satellite images) and maintenance on ISBA (A. Horanyi, G. Radnoti)
- Operational fail-safe ftp scripts (T. Szabo)
- Verification of the ALADIN model (I. Ihasz)
- Visualization of ALADIN products (S. Kertesz).

7. *In Morocco*

- Statistical verification of ALADIN-MAROC (W. Sadiki)
- Tests of AL07, development of a new version of CHAGAL using MAGICS software instead of NCAR (R. Ajjaji)
- Validation of AL08 (with and without ISBA), tests for running the non-Hydrostatic version of ALADIN (J. Boutahar)

- Study of the closure for convection, forecasted satellite pictures (M. El Abed)
- Integration of all observations data over ALADIN-MAROC domain in ALADIN-MAROC, creation of CMAFOC files (H. Haddouch).

8. In Poland

- Software development for automatic data acquisition (A. Dziedzic)
- Software development for NWP products dissemination (W. Owcarz)
- ALADIN optimization on SP2 machine, porting auxiliary software to SP2, administration and organization (M. Jerczynski)
- NWP products visualization with vis5D (M. Szczech, J. Woyciechowska).

9. Portugal

- Operational installation on DEC workstation and modifications for ISBA (C. Madeira)
- Administration, observation conversion with Mandalay (M. Almeida)
- Verification, graphical tools (F. Prates).

10. In Romania

- Data assimilation and ISBA (L. Dragulanescu)
- Implementation and validation of ISBA (E. Cordoneanu)
- Verification (C. Dutescu)
- Physical parametrizations (O. Valianatos)
- Tests with the non-Hydrostatic version (D. Iorgulescu)
- Vertical resolution, sensitivity and LBC (M. Caian)
- LBC and validation (V. Ivanovici).

11. In Slovakia

- Visualization of fields (M. Kanokovska)
- Verification (J. Vivoda)
- Verification of pseudo-TEMPs (M. Gera)
- ALADIN for workstation (O. Spaniel)
- Diagnostic parameters derived from ALADIN (A. Simon)

- Data collection (R. Danis).

12. *In Slovenia*

- Visualization (N. Pristov)
- phasing and ISBA (J. Jerman)
- Validation (M. Zagar)

13. *Deported work by Météo-France*

- Nothing this quarter.

ALADIN developments in Toulouse during the second quarter of 1998

Around 30 persons (including 3/4 of visitors) have almost reached the common effort of 60 people.month. Some have contributed to the success of one (at least !) of the following main events and/or have dealt with more specific research or development studies.

1. *Main events in Toulouse this quarter*

- the operational suite (ARPEGE and ALADIN-FRANCE) was implemented on the Fujitsu and is operational since the 29th of June.
- the phasing for preparation of ALADIN cycle 9 is going on since the beginning of June, with the Toulouse GMAP team (under C. Fischer coordination) and the participation of R. Ajjaji and J. Boutahar (Morocco), P. Neytchev (Bulgaria), C. Soci (Romania) and the help of other visitors present at that time in Toulouse (R. Bunova from Czech Republic, Ilian Gospodinov from Bulgaria, C. Madeira from Portugal, ...)

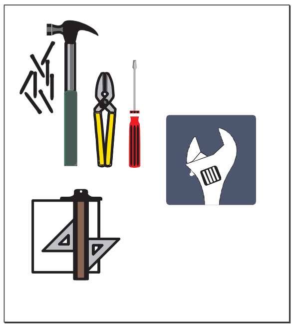
  Fruit of several phasings' experience, the ***"ALADIN phaser's guide"*** has been published. It will be a very useful tool for all future phasers. Many thanks to the authors (R. Ajjaji, J. Boutahar & J.-F. Geleyn)

  It is available on our public ftp (see Annexes).

- R. Bubnova (Czech Republic) and M. Siroka (Slovakia) have taken care of ALADIN-LACE in Toulouse this quarter.

- a new tool ALMA : ALadin MAnager should help you to run most of the utilities developed around ALADIN and, in a future version, will prepare scripts for the different configurations of ALADIN.

  At the moment, the utilities available on the Fujitsu VPP and the SUN workstation are :



  - EDitField : transforms FA file to ASCII file containing latitude, longitude, value;

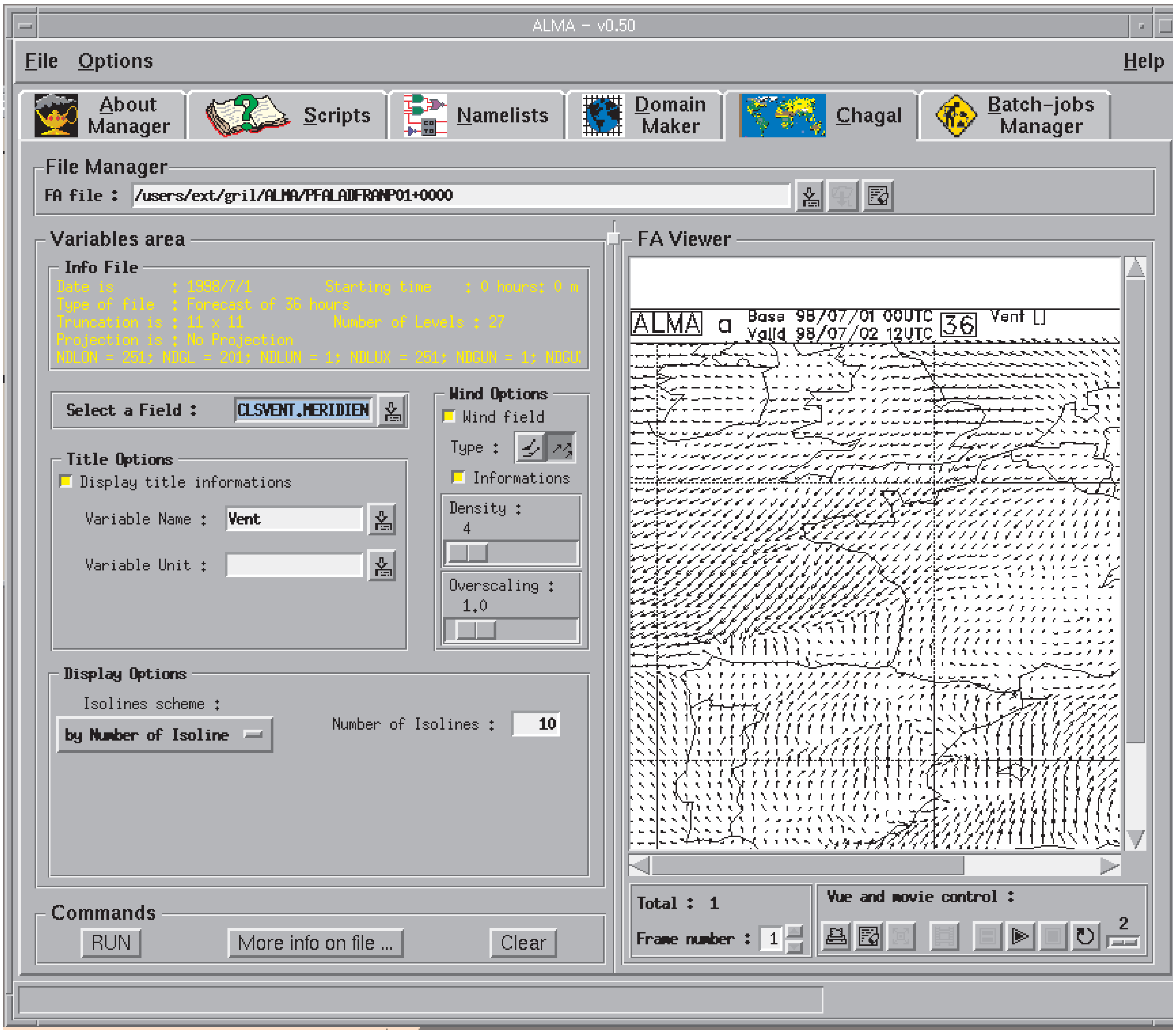
  - ECTOplasme : gives the energy spectra with respect to the total elliptic wave number (it is a better and less expensive version of former SPECWOR);

  - FRODO : extracts informations from the header of a FA file;

  - CHAGAL : plots ALADIN files using NCAR software.

  Today, on the SUN workstation, ALMA can only "manage" CHAGAL but the three other utilities will be under ALMA control very soon.

  Please find below an example of ALMA interface.



2. *Other visitors research or development studies*

- D. Cemas : "Introduction of the semi-Lagrangian formalism for the lower boundary condition"

  In order to correct lower boundary condition for three terms in the NH dynamics, some analysis and the coding of one possible treatment of LBC eulerian formalism in eulerian and semi-Lagrangian mode was realized. A better way to improve this treatment in semi-Lagrangian model is still to be done. The work underlines the well-known interest for a ALADIN/2d vertical model for this kind of study.

- F. Chome : "Training on CANARI in ALADIN"

- D. Dvorak : "Radiative upper boundary conditions for semi-Lagrangian"

  Radiative upper boundary is a new method to formulate the top of the model. In contrary to the classical formulation, it should prevent reflection of vertical propagating waves from lower levels towards the top. Consequently, more realistic values of horizontal diffusion can be kept. Up to now, the new scheme can run with good results on eulerian and semi-Lagrangian modes with three temporal levels.

- M. El Abed : "Precipitation in ALADIN-MAROC"

  Forecasters notice that ALADIN-MAROC gives excessive precipitations during hot season. A study of typical cases was done and a proposed solution of modification of the calculation of the specific humidity in the CANARI analysis was tested with success.

- G. Ganev : "Maximum length of the time-step with latest refinement of the semi-Lagrangian scheme"

  The possibility of extension of the time-step in ALADIN (in the frame of the future increase of the resolution) was studied. Experiments were made to verify the stability of the semi-Lagrangian scheme when modifying the time-step and using new dynamics and new physics.

- M. Jerczynski : "Different studies related to the latest changes in semi-Lagrangian scheme and physics package of the ALADIN model"

  First, the new anti-aliasing improvements was proved to allow the shift of the default value of NTRUN parameter from 25% to 80% of NSMAX.

  Then, instability problems were studied.

  As a consequence to M. Jerczynski and G. Ganev stays, a saving of 20% to 25% of the operational time-step can be expected.

- C. Madeira : "Cloud optical properties retuning"

  The current setup of ARPEGE/ALADIN radiative transfer parameterization scheme presents three problems: an albedo too high, too thick ice clouds in thermal radiation and not absorbing enough ice clouds in solar one. A retune of the optical properties was done in order to attempt to solve these three problems taking into account the constraint that solar absorption by liquid water should be kept roughly constant.

- M. Monteiro : "Diagnostics on the calculation of background error covariances using NMC method"

The comparison the statistics of background error using NCEP method in ALADIN-LACE and the statistics for ALADIN-FRANCE obtained by L. Berre shows the interest of a 4D-Var assimilation in ALADIN.

- R. Mladek : "Heavy Precipitation in the Alpine Region"

  Software for computations and results plotting has been prepared. Data are available only from Italy (until 1997) and France. Data from the two other participants (Switzerland and Germany) are long in coming and will be treated during the next stay.

- F. Prates : "Study of the coupling between a hydrostatic coupling and non-Hydrostatic coupled one"

  The aim of this work was to study the coupling between the hydrostatic and the non-Hydrostatic versions of ALADIN model on a high resolution. A set of simulations were performed using the semi-Lagrangian, three-time-level schemes on a 2.5 km horizontal resolution and 40 vertical levels. A new orography dataset with 1 km horizontal resolution was used to define the model orography. The boundary files were taken from the forecasts of ALADIN for the PYREX Case experiment.

- M. Siroka : "Introduction of new Jb, i.e. statistical balance, in ALADIN"

  The so-called "New Jb" term of ARPEGE/IFS (statistical and balance characteristics of forecast error incorporated in the background constraint of variational data assimilation) was adapted fro 3D-Var ALADIN. New and specific feature of ALADIN is the multivariate treatment of the humidity forecast errors. New Jb was technically tested (gradient test of Jb) but no meteorological validation (e. g. single obs experiment) was yet performed.

- V. Spiridonov : "CROCUS"

  The CROCUS model was coupled with the 1D version of ARPEGE model.

- J. Vivoda :"Intercomparison of physical packages"

  The 1D version of ARPEGE/ALADIN model was modified by adding CLIMA-ARPEGE configuration which uses another radiative scheme. Then, the ECMWF part of the IFS/ARPEGE was added in the 1D model requiring the interpolation of deep soil variables.

- M. Zitouni :"Impact of surface analysis with ISBA and CANARI in ALADIN"

  Two assimilation suits were developed : one with only surface analysis and the other, much more expensive, with all levels analysis. Tests were performed on different domains for 48 hour integration. Results are very similar (for prices very different !) and very close to the results obtained without analysis. This underlines the necessity of new tunings or improvements in the surface analysis in ALADIN model.

- E. Zsoter : "Impact of higher vertical resolution in ALADIN"

  Experiments were made to test the impact of more vertical levels in ALADIN. As a first approach, 41 vertical levels instead of 27were introduced, without touching the theoretical part of the defining procedure of the vertical spacing, and also not involving a new assimilation cycle. Evaluation of how big further improvement might be expected increasing the vertical resolution of ARPEGE, in the procedure providing coupling files for ALADIN run was done. The overall verification results of the forecasts with 41 levels are moderate, there are rather some deterioration on the surface, and just a slight improvement in the atmosphere.

3. Other research or development studies by the Toulouse permanent staff

- Configuration 601 has been coded for ALADIN and is being tested (C. Fischer)
- Thanks to J.-M. Audoin, ALADIN can now run on our SUN workstation. The configurations e001, e927 and Full-Pos are available but some optimizations are still necessary. Some tools (import_fa, grogrid, new version of libemos) run on SUN platform too.
- The configuration e923 was improved through the resolution of various problems, the introduction of the possibility of using an input spectral orography and a sparing of computer time; this configuration was also used for new applications (D. Giard, P. Le Moigne).

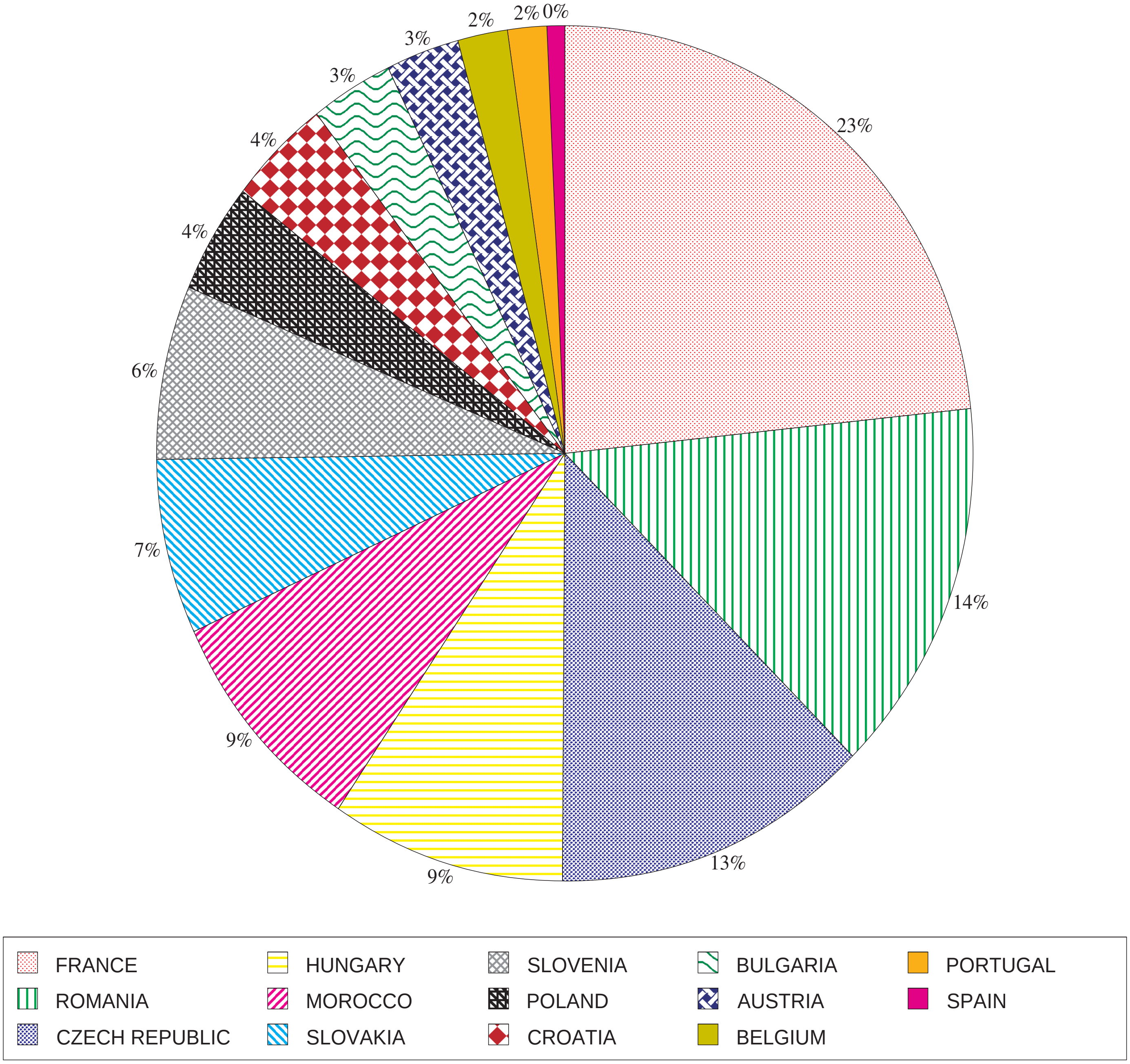
Annexes :

List of documents available on public ftp : cnrm-ftp.meteo.fr, under the directory /pub-aladin on the user anonymous

- Toulouse_stays.ps , ***updated on 28-07-98*** : visitors expected in Toulouse in 1998 (provisional document).
- participations_Toulouse.ps , ***updated on 27-07-98*** (5 pages) : graphics statistics of the participation in the Toulouse part of the ALADIN project. Statistics on June 30, 1998.
- participations_compare.ps , ***updated on 27-07-98*** (4 pages) : graphics statistics of the participation in the ALADIN project, since the last quarter of 1995, with a comparison of deported work and work realized in Toulouse. Statistics on March 31, 1998.
- participations_total.ps , ***updated on 27-07-98*** (4 pages) : graphics statistics of the participation in the Toulouse part of the ALADIN project. Statistics on June 30, 1998 for the Toulouse part and March 31, 1998 for the Deported work.
- news9.ps : ALADIN Newsletter 9 (color postscript), updated on 30-01-98 (26 pages)
- news9bw.ps : ALADIN Newsletter 9 (black and white postscript), updated on 30-01-98
- news10.ps : ALADIN Newsletter 10 (color postscript), updated on 19-05-98 (42 pages)
- news10bw.ps : ALADIN Newsletter 10 (black and white postscript), updated on 19-05-98
- ***news11.ps*** : ALADIN Newsletter 11 (color postscript), updated on 30-07-98 (30 pages)
- ***news11bw.ps*** : ALADIN Newsletter 11 (black and white postscript), updated on 30-07-98
- wk_minutes_980330.ps: Minutes from the ALADIN Workshop on various implementations of the model within ALADIN partners held in Toulouse last February (5 pages), updated on 30-03-98
- aladintheque.ps : list (with abstracts) of 88 ALADIN documents available in paper format, updated on 19-05-98
- ***ama98.txt*** : call for contributions for the "Atelier de l'Atmosphère" to be held in Toulouse on December 8-10th, 1998, updated on 28-07-98
- ***phasersguide.ps*** : the ALADIN phaser's guide, updated on 30-07-1998
- ***docECTO.v1.00*** : documentation of the ECTOplasm utility, updated on 04-06-1998
- ***docEDF.v1.10*** : documentation of the EDitFile utility, updated on 04-06-1998

Total Participation in the ALADIN project

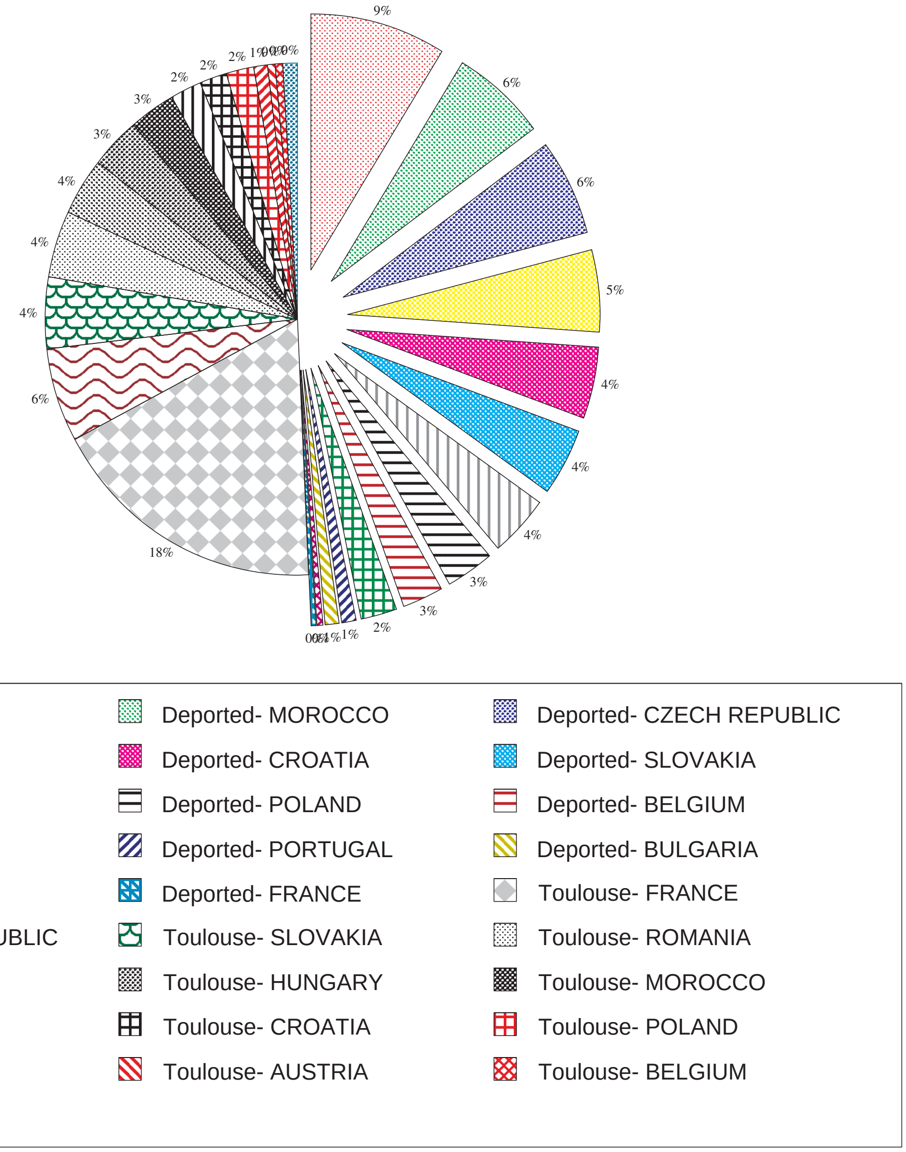
Breakdown of the person.months by countries



Updated on 30-JUN-98 (Toulouse) and 31-MAR-98 (Outside)

Participation in the ALADIN project since the last quarter of 1995

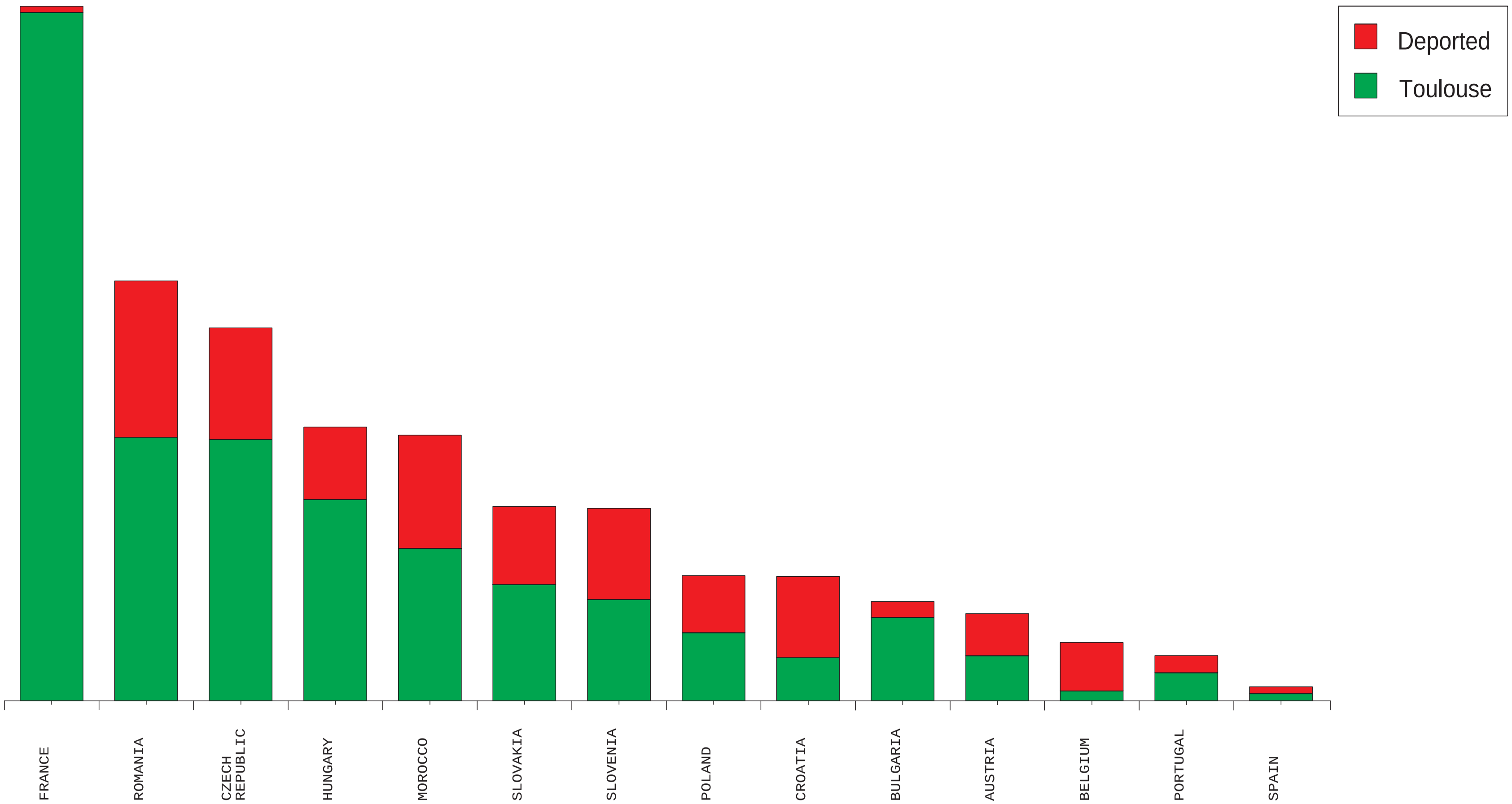
Breakdown of the person.months by countries (Toulouse/Deported)



Between 30-SEP-95 and 31-MAR-98

Total Participation in the ALADIN Project

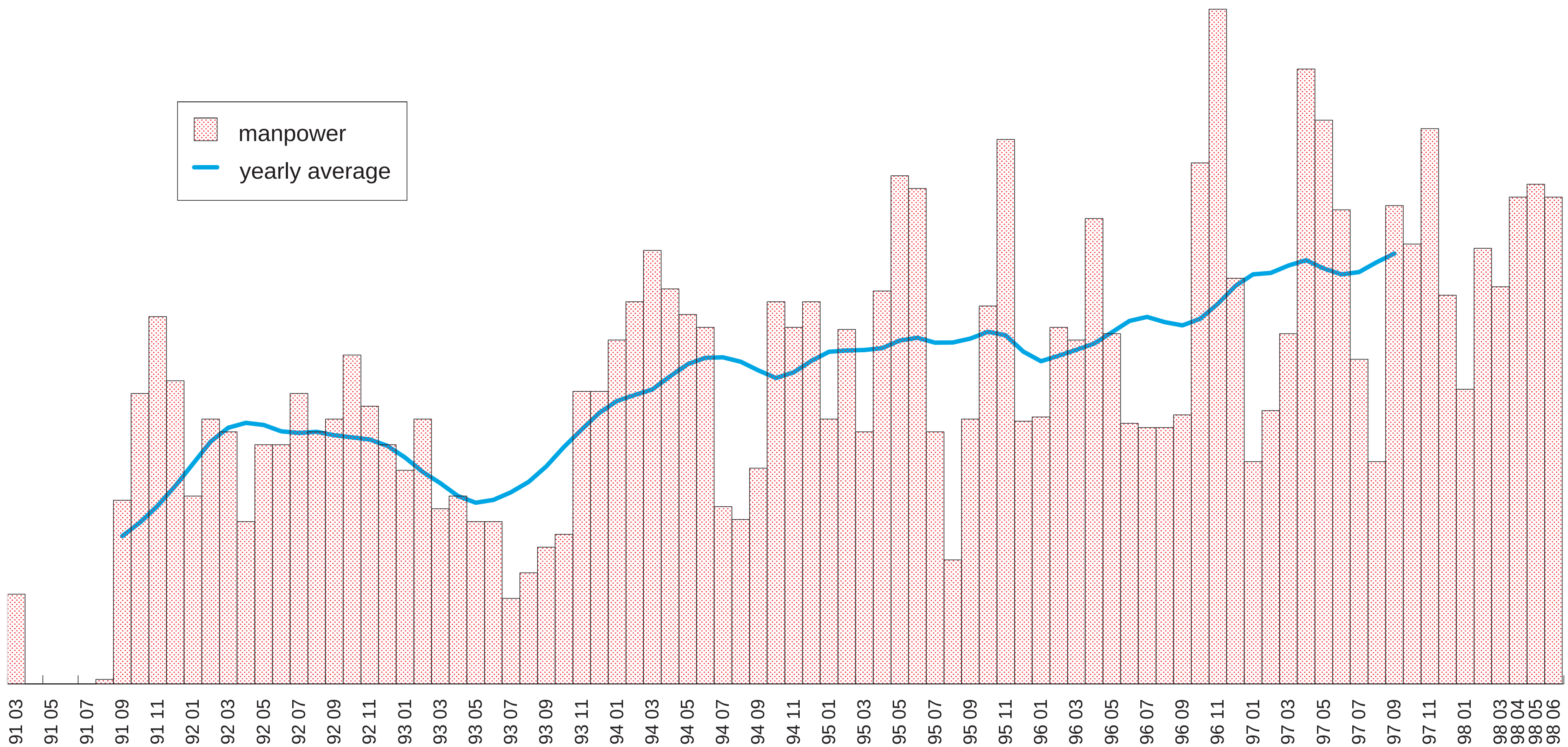
Breakdown of the person.months by countries



Bilan Total (Toulouse + Exterieur)

Participation in the Toulouse part of the ALADIN project

Evolution of the monthly manpower



Updated on '30-JUN-98'