

THE ALADIN COLLABORATION

WWW.CNRM.METEO.FR/ALADIN

ALADIN is a successful collaboration on numerical weather prediction involving 16 National Meteorological Services in Europe and Northern Africa. It started after an initiative taken by Météo France in 1990 and has been growing to a large-size international collaboration of about 90 full time equivalents. Since its start, the program has brought its members to the forefront of the developments in high-resolution short-range Numerical Weather Prediction.



OBJECTIVES

→ Code development

The main activity is the conceptualization, definition, development, operation, and the maintenance of a shared, state-of-the-art, high-resolution Numerical Weather Prediction system called **the ALADIN System**¹. This system is used to configure the Numerical Weather Prediction applications in the participating member states. The code is shared with the global ARPEGE model of Météo France and the Integrated Forecast System (IFS) of the European Centre for Medium Range Weather Forecasts (ECMWF). The applications of the ALADIN System can run on limited geographical areas at about ten times higher resolutions than the ones of the global applications, allowing to compute weather forecast maps in high detail.

→ From science to operations

Significant scientific achievements are published in leading international journals. The ALADIN program coordinates scientific research and implements the scientific results into the new versions of the ALADIN System. These versions are regularly exported and installed on the High-Performance Computers in the Institutes of the ALADIN members.

They are implemented in the operational applications. The members then run the numerical weather prediction model on limited areas covering their national territories. Feedback from the weather forecasters of the Institutes is used to steer future Research and Development (R&D).

→ Expertise building

ALADIN provides a specialized background for training and recruitment of experts. This background is tightly linked to the national applications and is, as such, unique compared to purely academic research. This allows the members to create small to medium size teams to carry out R&D at a state-of-the-art international level.

→ Pooling of Resources

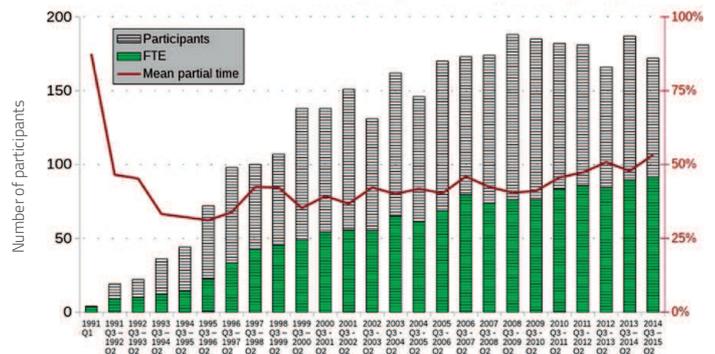
The activities of the consortium are supported by collective commitments of human resources to the operational and maintenance efforts, and to the management activities. The program has been used as a background to draw extra resources from external funding, both at national and international levels.



Country	Year	Participants	FTE	Mean partial time
Algeria	1991	1	0.1	0.1
Austria	1991	1	0.1	0.1
Belgium	1991	1	0.1	0.1
Bulgaria	1991	1	0.1	0.1
Croatia	1991	1	0.1	0.1
Czech Republic	1991	1	0.1	0.1
France	1991	1	0.1	0.1
Hungary	1991	1	0.1	0.1
Morocco	1991	1	0.1	0.1
Poland	1991	1	0.1	0.1
Portugal	1991	1	0.1	0.1
Romania	1991	1	0.1	0.1
Slovakia	1991	1	0.1	0.1
Slovenia	1991	1	0.1	0.1
Tunisia	1991	1	0.1	0.1
Turkey	1991	1	0.1	0.1

OPERATIONAL CONFIGURATIONS IN ALADIN CONSORTIUM

TOTAL PARTICIPATION IN THE ALADIN PROJECT
Evolution in the yearly Full Time Equivalent (green)



1. The acronym is derived from the French expression Aire Limitée Adaptation dynamique Développement InterNational.

APPLICATIONS

The ALADIN consortium provides a platform for the ALADIN members for organizing optional activities related to numerical weather prediction. This can be done by individual members or in more intense optional multilateral collaborations. The applications range from nowcasting tools, specific academic case studies, to past and future climate simulations. Long model runs are used for creating atlases of wind climates. Climate-change simulations are carried out in the context of international regional climate modeling programs such as, for instance, the CORDEX project.

The most notable organization that takes part in the ALADIN consortium is the LACE consortium with 7 members in Central Europe. This consortium provides extra resources to exchange and to process meteorological data used in the model. It develops and maintains a pan-European probabilistic forecast system called LAEF. The ALADIN consortium shares its code with the HIRLAM consortium in a close scientific and technical collaboration.

FLASH FLOOD EVENT IN AUSTRIA IN 2016

Local flash floods connected to severe thunderstorms occur regularly during summer time in the Alpine region. They can have devastating consequences for people, environment and economy. Weather warnings issued in time may help to reduce damage or even prevent fatal casualties. The predictability of these events and the associated extreme precipitation rates has been generally low during the past, in particular when relying on global model forecasts which are not able to resolve these phenomenon sufficiently.

The Limited Area Model configurations of the ALADIN system like AROME and ALARO are able to provide the essential information for a more accurate and early warning. On 1st of June 2016 the border region between Austria and Germany was affected by a flash flood event related to a series of thunderstorms resulting in precipitation rates up to 200mm/24h (see INCA analysis, top left figure). While the event is clearly underestimated by the global ECMWF/IFS model (bottom left), the Austrian AROME configuration from ZAMG (top right) forecasted a far more realistic scenario considering the amount and the location of precipitation.

