

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.

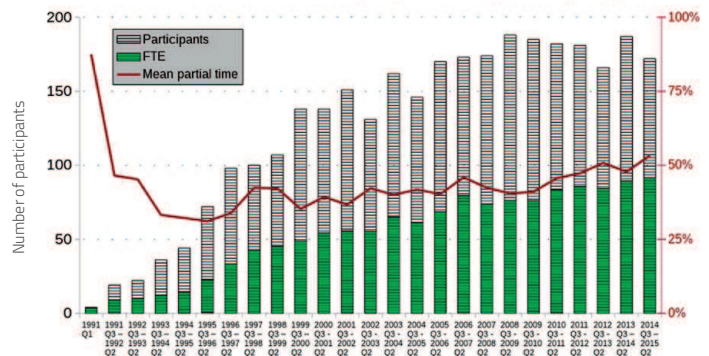
→ Pooling of Resources

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.



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.

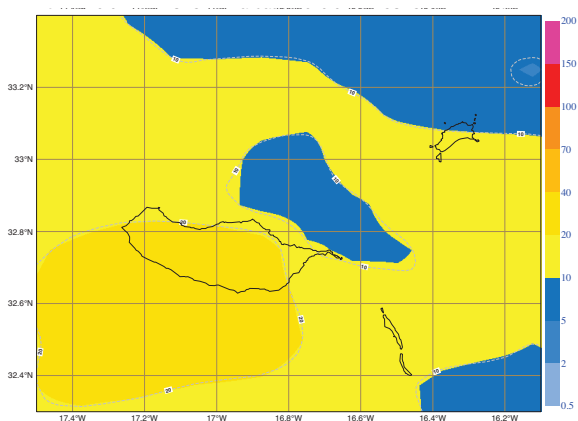
The most notable organization that takes part in the ALADIN consortium is the LACE consortium with 7 members in Central Europe. This consortium provides extra resources to exchange and to process meteorological data used in the model. It develops and maintains a pan-European probabilistic forecast system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

FLASH FLOODS IN MADEIRA ISLAND IN FEBRUARY 2010

On the 20th of February 2010, the Madeira area was affected by an active cold weather front with significant embedded convection. Observed precipitation reached a maximum of 380 mm in 24 hours at Arieiro station (1580 m), in clear contrast with the smaller amounts at low level locations in the west and north parts of the Island. The heaviest precipitation occurred in the period from 12UTC to 15UTC, when Arieiro recorded 114 mm/3h. Funchal (at the mean sea level in the Southern coast) recorded 72mm/3h from 9UTC to 12UTC. Severe flash floods in the Island were widespread, particularly in Funchal, causing more than forty fatalities and extensive damage to property.

Despite the useful guidance in timing and location provided by ECMWF/IFS (left) and by other locally available Limited Area Models, forecasts of precipitation amount were far too low when compared to observations. The forecast of 6-hour accumulated precipitation by the local (under testing at the time) version of the high-resolution AROME (right) was far more realistic, with the potential to trigger the Weather Warning System 24 hours in advance. This severe event clearly showed the benefits of using high resolution models such as AROME, because they are able to simulate convective processes explicitly and give a more detailed guidance in situations where orographic forcing plays a major role.

ECMWF/IFS: FORECAST OF 6-H ACCUMULATED PRECIPITATION, VALID AT 15UTC ON 20 FEBRUARY 2010



AROME-MADEIRA: FORECAST OF 6-H ACCUMULATED PRECIPITATION, VALID AT 15UTC ON 20 FEBRUARY 2010

