



ALADIN in TUNISIA

National Institute of Meteorology
Department of Research and Development

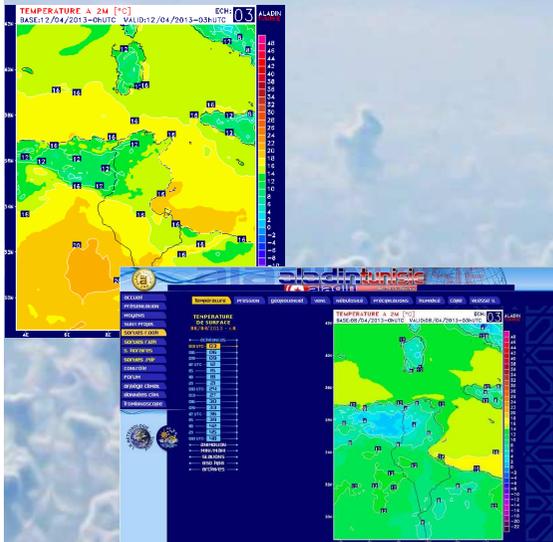
Operational suite

Tunisia joined the ALADIN project on May, 31st 2001. On March, 23rd 2004, ALADIN-Tunisia turned to operational mode.

The ALADIN-Tunisia domain parameters are:

- Operational cycle: cy29T2_op2.13.
- Horizontal resolution: 12.5 km
- Longitude points: 117
- Latitude points: 151
- Vertical levels: 41
- Forecast range: 48h
- Operational runs: 00h and 12h

The Forecast graphical outputs are updated twice a day in a local ALADIN website that provides the hourly and 3-hours forecasts for 9 parameters: 2m temperature, surface pressure, 500hpa geopotential, 10m wind, nebulosity, rain, humidity, cape and 850 hpa vertical velocity.



Computing power

Since January 31st 2003, the National Institute of Meteorology acquired a new super calculator. It's an IBM pSeries 690 with the following characteristics:

Machine Type	7040
Microprocessor Type	64-bit POWER4
Frequency	1.3 GHz
Shared Memory	256 Gb
Processors	32
Internal Memory	4.5 Tb



ALADIN with SURFEX

On July 2012, a new version of ALADIN Tunisia with SURFEX was realized and experienced in Toulouse, France.

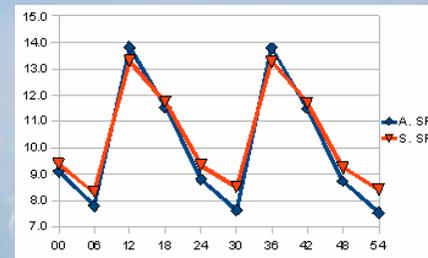
This version has the following characteristics:

- Cycle: cycle cy37t1-op1.07.
- Horizontal resolution: 7.5 km
- Longitude points: 205
- Latitude points: 259
- Vertical levels: 70
- Forecast range: 54h
- Experienced run: 00h

The comparison of the output results concerned four parameters; 2m temperature, 10m wind, rain and humidity. The main SURFEX impact was noticed in the 2m temperature and the 10m wind forecasts as follows:

1) 2m temperature:

The comparison concerned two months of forecasts: January and June of 2012. SURFEX code had an effect of cooling during the night time and warming during the day time:

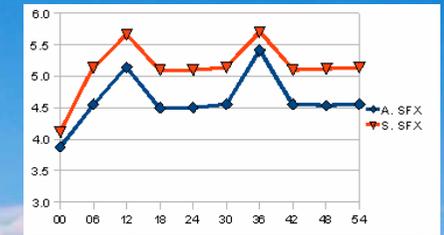


Difference of 2m temperature between forecasts with (blue) and without (red) SURFEX, January 2012

2) 10 m wind:

The comparison of forecasts with and without SURFEX showed a lowering of wind speed especially in night time. This impact was noticed in both January and June.

The following graphic shows SURFEX effect on wind speed:



Difference of 10m wind between forecasts with (blue) and without (red) SURFEX, January 2012

AROME

A first run of AROME over a Tunisian domain was done on December 2012 in Toulouse, France.

This new version has the following characteristics:

- Cycle: cy37t1-op1
- Horizontal resolution: 2.5 km
- Longitude points: 400
- Latitude points: 550
- Vertical levels: 60

A study of two extreme situations showed better forecasts with AROME than with the operational ALADIN-Tunisia model. As an example, the cumulated 24h rain of the situation of October, 30th 2011 is described by the following pictures:

