Objective control of ALBACHIR application

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The ALADIN-Morocco application, named ALBACHIR, became operational in February 1996. Many developments were accomplished in order to improve the model performances and the forecast quality. These concerned both the software (model cycles) and the hardware (computation machines). The evaluation of this evolution requires an objective and regular control of the model.

This paper aims to explain several phases of the automatic process designed for the objective control of the operational ALBACHIR version, running on the IBM calculator. Two references are used : **Observations** and the **ARPEGE analysis**.

As a first version, it was decided to control only the first 24-hour range of forecast produced by the two daily runs of the model. Furthermore, it is planned to process other forecast ranges : 12, 36 and 48 hour.

Model control versus ARPEGE analysis

The ARPEGE analysis (long cut-off) is considered as a reference. The ARPEGE fields are interpolated onto the ALBACHIR domain, using E(E)927 as for the production of coupling files. A space average (horizontally and vertically) of the difference ALADIN - ARPEGE is evaluated for the following parameters : geopotential, moisture, temperature, zonal and meridional wind.

Model control versus observations

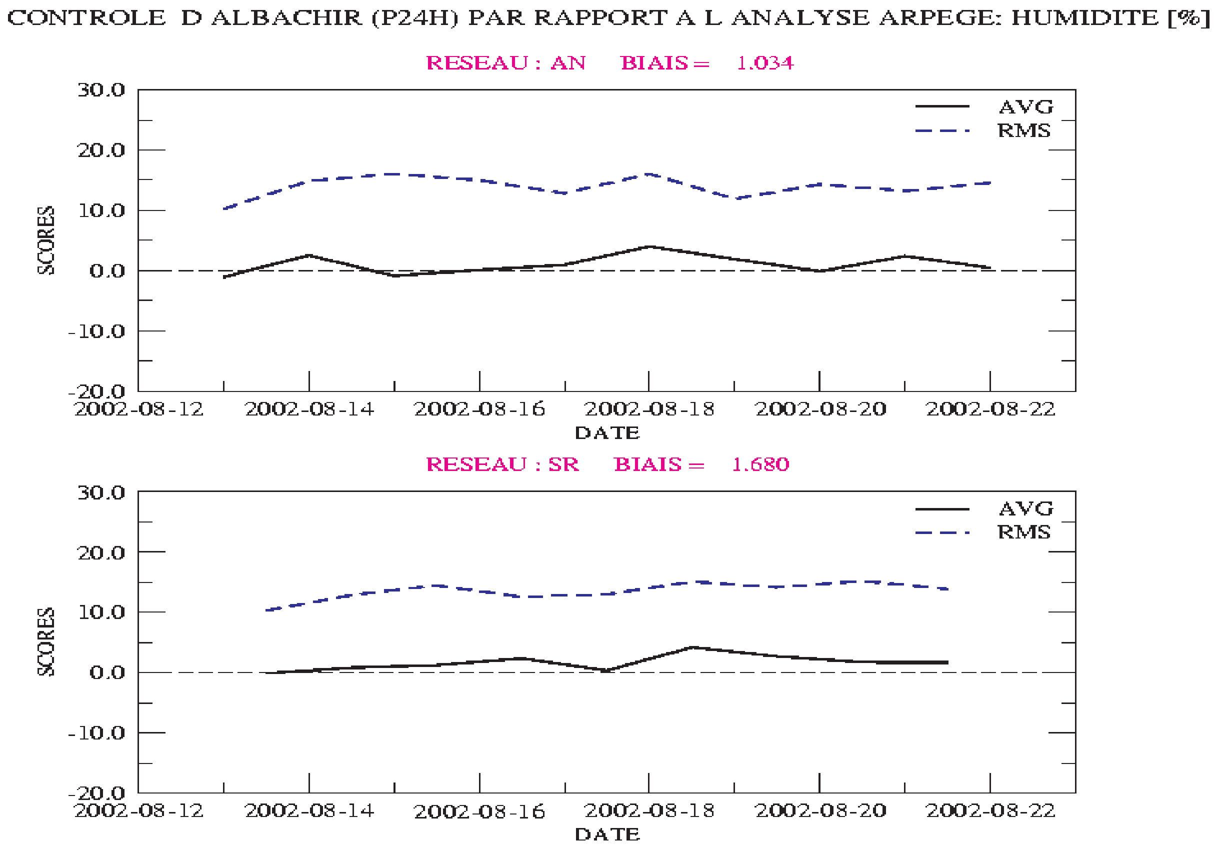
The reference is constituted by all informations coming from the synoptic network (SYNOP) and the radiosondes' one (TEMP). Space interpolation of the model fields onto observation points is carried out before computing the differences between the observations and the values of the model, using E701. The fields controlled by this method are detailed in the following table:

SYNOP	TEMP
Geopotential Moisture at 2 m Zonal wind at 10 m Meridian wind at 10 m Temperature at 2 m Surface temperature	Geopotential (all levels) Moisture (all levels / at 2 m) Zonal wind (all levels / at 10 m) Meridian wind (all levels / at 10 m) Temperature (all levels / at 2 m)

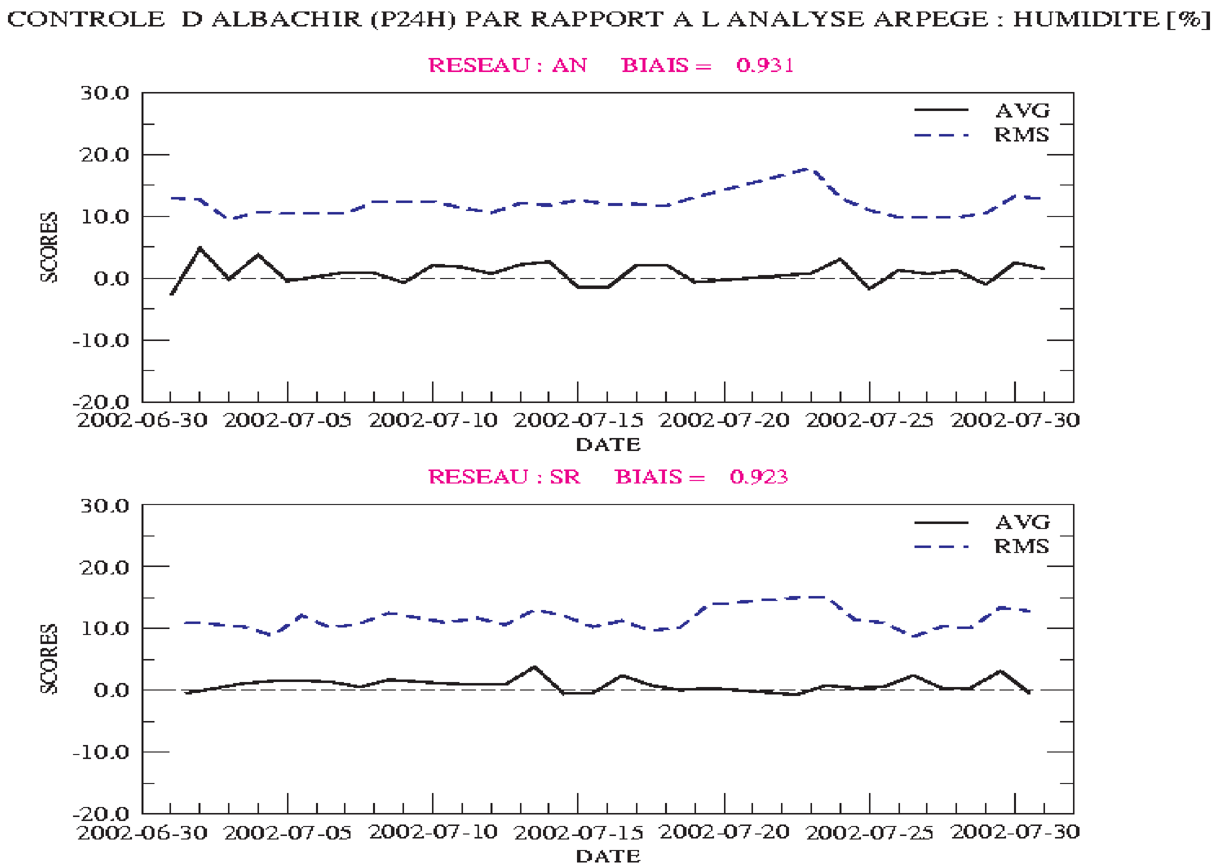
For the two types of control, the procedure is run daily over the previous 10 days. The outputs are the bias and the root-mean-square error for each day, separately for the runs of 00 h GMT (AN) and of 12 h GMT (SR). A similar procedure is run each month to control the performances of the model during the previous month.

The results are processed automatically by the graphic software XMGRACE, recently installed on the IBM, then visualised on the intranet web site of the numerical weather prediction service. The outputs are archived in ASCII tables and also as graphs for possible later studies.

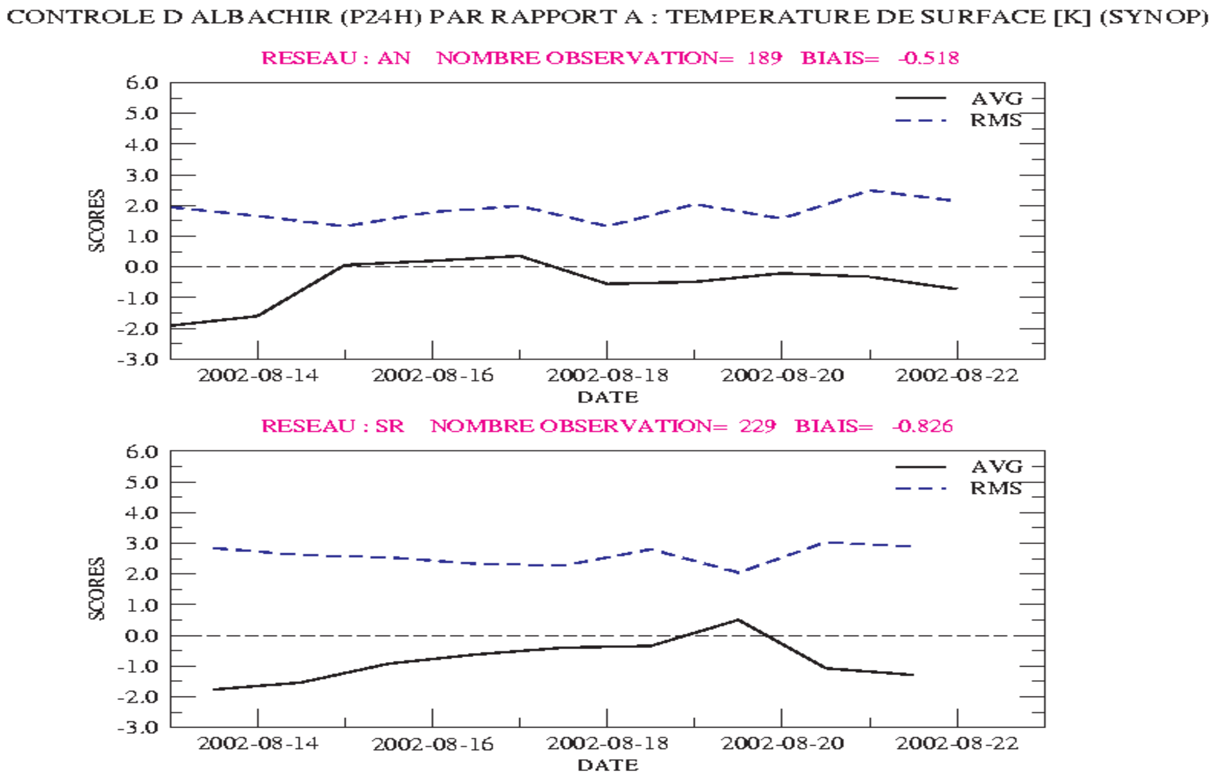
To interpret the graphs, it is necessary to take into account some elements. Indeed, the observation network on the domain of ALBACHIR has a deficiency in radiosoundings compared with the surface synoptic observations. That's why it is recommended to give more importance to the results of surface control. In addition, concerning the control versus ARPEGE analyses, the resolution of ARPEGE on Morocco varies between 25 and 60 km. It remains more sparse than that of ALBACHIR (16.7 km).



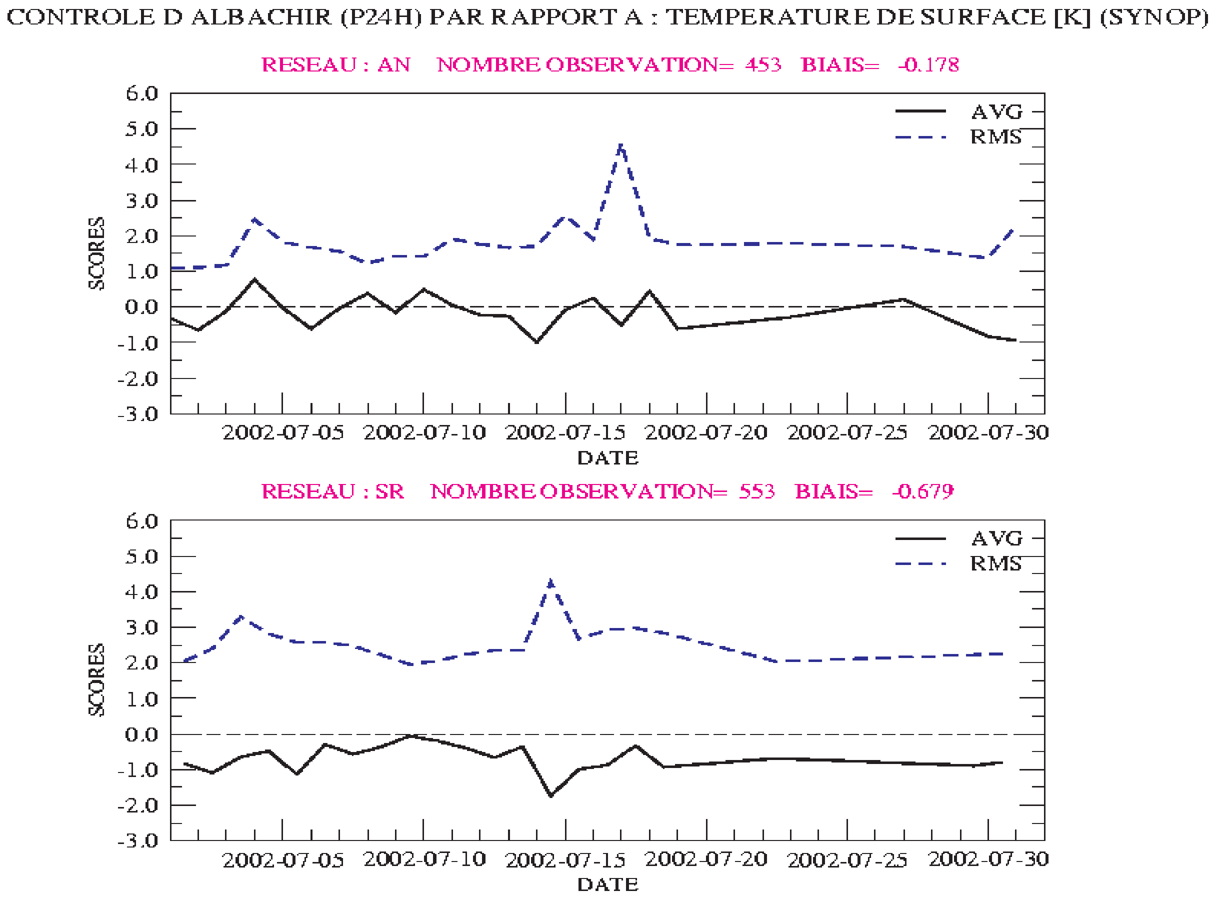
10-day control, 24 h forecast against ARPEGE analysis : moisture (%, vertical average)



Monthly control, 24 h forecast against ARPEGE analysis : moisture (%, vertical average)



10-day control, 24 h forecast against SYNOP observations : surface temperature (K)



Monthly control, 24 h forecast against SYNOP observations : surface temperature (K)