SIGTAF: an interactive TAF generation system

Introduction

• SIGTAF has been developed by Guillermo Ballester as an interactive system to generate TAF bulletins.

• SIGTAF is based on several dynamic libraries developed for this project and some binary cgi. The source code is written in C language, so that the rapidity of execution and the resources consumed are very well optimised.

• The visible part of SIGTAF is a binary cgi that generates webpages in an Apache2 server using Linux. However, the most complex tasks are carried out in dynamic libraries to which it is linked.

• SIGTAF analyses the format of the different character sequences of the aviation meteorological messages.

• Also it extracts all the values contained in those messages to be analysed.

• In addition, it contains useful routines for the comparison of observations (METAR) and forecasts (TAF).

• It interacts between the meteorological messages database and numerical model products. The Used DB is a local database specifically optimised to allow quick access.

• It uses the data from the numerical model (currently HIRLAM 0,05°) to generate an automatic TAF message (AutoTAF).

• SIGTAF provides powerful and efficient tools for the management and analysis of METARs and TAFs. In a PC environment, it provides analysis speeds of over 1000 messages per second and the generation of automatic TAFs in less than 0,1 second.

• It generates web pages with relatively simple HTML code.

How it works

• SIGTAF consists of three essential modules, activated by clicking the keys on the upper bar.

Configuration

The airports to be analysed are selected individually or by regional groups. It is also possible to select the date and a time period for the analysis. There is a module

of communications that is able to send the complex messages to the Communications System (SCM), although at the time of writing it was deactivated.

Editing

The system helps the forecaster to prepare the TAF. After selecting a type of message to issue (short or long TAF) for the chosen station, SIGTAF presents/displays a visual aid to make it easy:

Editing windows with the Bulletin header and the TAF. Any bulletins that have already been issued through the SCM are immediately displayed in both windows. If there are no available bulletins, the automatic TAF is displayed (this is what usually happens in the preceding hour at the time of issue of the TAF). The automatic TAF can come from the database of Autotafs or be generated at that point in time.

Analysis of the proposed TAF in the editing window. Any errors relating to the TAF coding are shown in plain language.

Exhaustive Analysis of the proposed TAF in the editing window. The active groups and the change groups are displayed on an hourly basis within the table. Additionally, if there are numerical model data available, sequences of pseudo-METAR's are displayed and these contain the predicted meteorological conditions in aeronautical language. The colour of each cell in this table is the NATO colour state that relates to the meteorological conditions described.

An AutoTAF is generated using Hirlam 0,05° data and stored in the database. Two examples are shown below.

Monitoring

A key on the left panel allows the user to choose the station and message type. It has four sections:

1 Syntax Window. The result of the syntax analysis of the TAF is shown.

2   Observation versus prediction (METAR versus TAF). A list with all METAR and SPECI issued during the validity period of the TAF is displayed. In cases where a weather element is observed but has not been suitably predicted by the TAF, the corresponding part of the METAR is emphasised in a red colour.
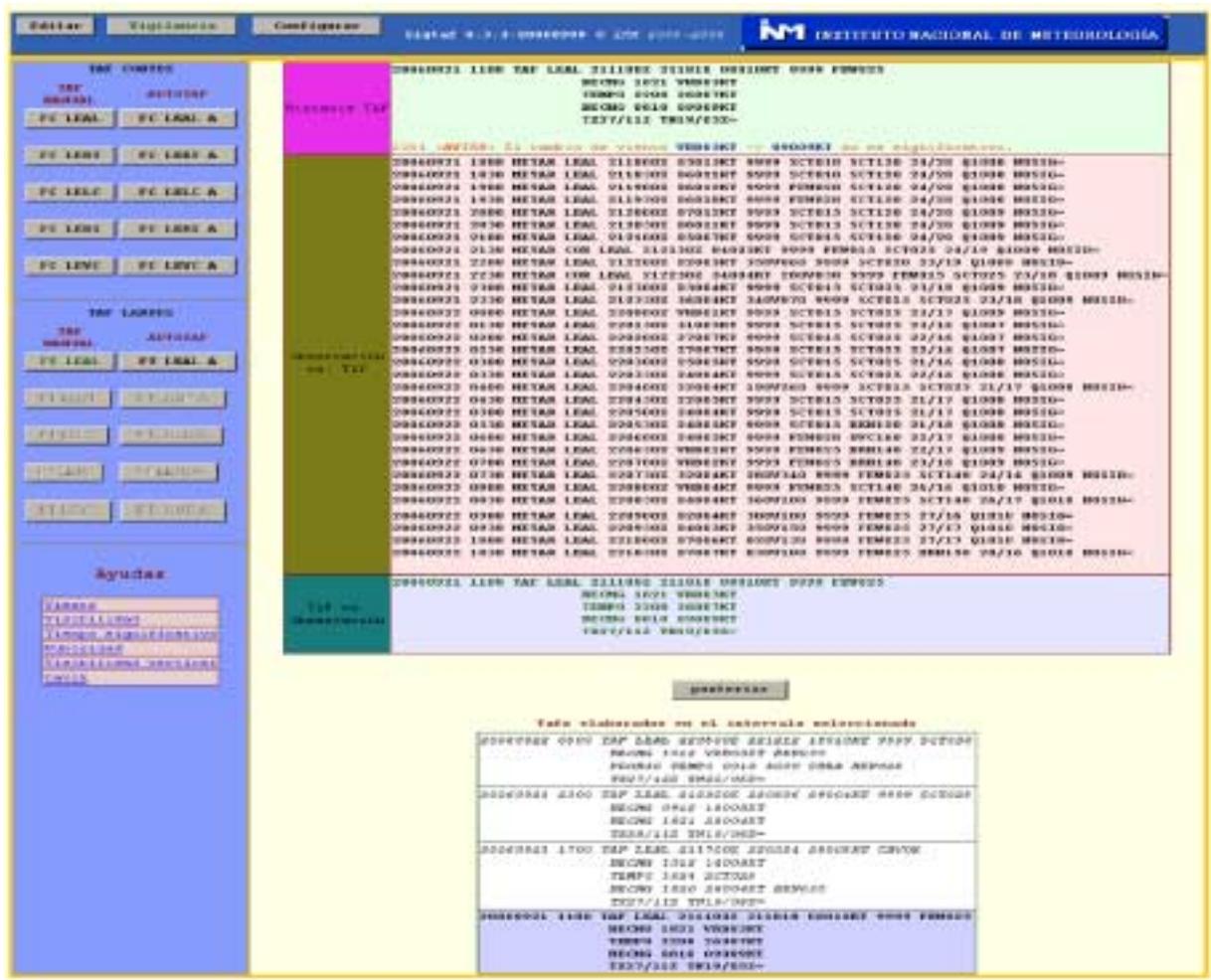
3   Prediction versus Observation. In this case, if a weather element has been predicted (TAF) but has not been verified, the corresponding part is emphasised in colour (orange is used for TEMPO groups and red for the main groups). If there is no observation to compare against, the message will be grey.

4   Spread messages win-dow. With the keys "previous" and "later", the user can select the TAF to be monitored.

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