



Norwegian
Meteorological
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HATM – HIRLAM ALADIN Tools Market

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Why? and Goal

Why?

- Several times I was convinced that similar tools are implemented at different centres differently.
 - Pros: not porting bugs from others, ...;
 - Cons: loss of time spent, instead of solving more important tasks;
- More and more centres have reached a “mature (able to test different components of the DA system) stage” of DA system implementation. We face similar tasks/problems when trying to tune and further developing the system;

Goal

- To inform each other about the developed/implemented tools and their availability (portable or not, published or well documented, etc. ...)

Pre-processing tools - 1

- **Generation of SEVIRI GRIB from HDF5** – Authors: Script (Roger R.), Grib converter and other utilities provided by Phillippe Marguinaud, well documented by Alena Trojáková.
 - It is basically a file (format) converter tool which can produce suitable GRIB format for BATOR from original HDF5 format. In fact the HDF5 files are the output (BT and cloud information) of **SAF/NWC** package.**Contacts:** Máté Mile, Alena Trojáková, Roger R

- **GPS ZTD pre-processing** – Authors: Mats Dahlbom, Jana Sanchez
Script-based converter of ASCII-formatted GPS ZTD data to OBSOUL data
Contacts: Jana Sanchez, Mats Dahlbom,

- **GPS ZTD pre-processing** - Author: Paul Poli
Selection of ground based GPS receiver stations for whitelist and pre-processing of the ZTD data can be made by this package.
Contacts: Máté Mile

Pre-processing tools - 2

→ Merge_VarBC – Merge content of two VarBC files. Useful tool to manage coefficients that are cycled differently. We'll need this tool to cycle radiance, GPS, and Aircraft VarBC coefficients.

Contacts: Magnus Lindskog (when ready :))

→

ODB-related tools

→ **Offline observation perturbation** (PERTOBS) – Author: Andrea Storto, using Mike Fisher's routines.

This is a short program(with 3 or 4 fortran routine) to perturb observations in ODB with a random number scaled by observation errors. Useful for both EDA (especially for Canari) and DFS computation. Compilation under Gmckpack.

Contacts: Roger R., Máté Mile

→ **ODB viewer** - Author: Sami Saarinen

This viewer can provide several ODB commands and tools in order to extract information from ODB. This is a standalone package therefore it can be used for different versions of model cycles. Well documented by Eoin on Hirlam wiki:

Contact: Eoin Whelan, Máté Mile

→ **ODB-API to diagnose DA performance (from Eoin Whelan).**

Convert all ODB-1 data to ODB-2 using "odb_migrator". one can interrogate the data in ODB-2 format easily and quick using the "odb" tool.

For visualisation use Metview. Metview and Metview Macros easily read ODB-2 data for plotting. Details of all this and pointers to a simple Metview Macro on ecgate are available [here](#):

<https://hirlam.org/trac/wiki/HarmonieSystemDocumentation/StandaloneOdb> (This page also includes information on how to get licenses for the old ODB software)

Post-processing and monitoring tools

- **Observation monitoring for ODB visualisation.** Author: Sándor Kertész.
This is a nice visualization software which can handle ODB data and plot several diagnostics and statistics. All Obsmonitor program has an html interface therefore you can drive the results by clicking. With GUI (GMT + php).
In use as LACE observation monitoring, [see <http://www.rclace.eu/forum/viewforum.php?f=40>](http://www.rclace.eu/forum/viewforum.php?f=40)
Contacts: Alena Trojáková, Máté Mile
- **VarBC performance diagnostics (radiance data).** Author: Roger R., further improved by Andrea Storto and Alena Trojáková.
Set of scripts, Fortran programs, R scripts. Plots on time-series of bias and STDV, which can help you to choose active satellite channels.
Contacts: Roger R., Alena T., Máté M.
- **Observation monitoring using SQLite (under development – contributors are welcome).** Authors: Trygve Aspelien
While the two tools above need preliminary extracted data, this tool do direct reading of the content of the ODB. With GUI (R + SHINY).
Contact: Trygve Aspelien

Diagnostic tools – 1

- **TuneBR i.e. Desroziers method** – Authors: Gergely Bölöni, Benedikt Strajnar
This package is for diagnosing and tuning observation and background error standard deviations. The diagnostic/tuning method is based on Desroziers et al. (2005), see <http://www.rclace.eu/forum/viewtopic.php?f=30&t=248>.
Contacts: Benedikt Strajnar, Máté Mile, Alena Trojáková
- **Matlab-based TuneBR** is available using two techniques: Hollingsworth and Lönnberg (1986) and Desroziers et al. (2005).
Author and contact: Malte Müller
- **TuneB.** Off-line spectral weighting the B matrix – **Author/Contact:** Malte Müller
- **Bmatrix - computation of a B matrix for a local domain.** see <http://www.rclace.eu/forum/viewtopic.php?f=30&t=62> , or <https://hirlam.org/trac/wiki/HarmonieSystemDocumentation/Structurefunctions>
- **DFS (Degrees of Freedom for Signals)** – Authors: Andrea Storto, Roger R.
This is a diagnostic tool to estimate the impact of the observations on analysis. The program is based on Chapnik et. al. 2006. With this tool absolute and relative DFS can be computed. R-based scripts are available for better presentation of the results.
Contacts: Roger R., Máté Mile

Diagnostic tools – 2

- **MTEN (Moist Total Energy Norm)** - Authors: Andrea Storto and Roger R. Tool for evaluating the sensitivity of the Forecast System to the withdrawn Observations (FSO) from the full OSE. It is based on Moist Total Energy Norm calculation for different forecast ranges. For details see: Storto and Randriamampianina (2010).
Contacts: Roger R., Máté Mile

Schemes

- **VERAL based on CANARI**, an old, but proper Verification package is working with history files and based on CANARI QC and ST. Surface and Upper-air RMSE-BIAS-STDE can be produced for main meteorological parameters.
see <http://old.chmi.cz/meteo/ov/aladin/docs/veral/>
Contacts: Alena Trojáková, Máté Mile
- **Offline OI_main** – Author: Jean-Francois Mahfouf
An offline version of OI_main program based on offline Surfex version 6.0.
Contact: Máté Mile, Dagrun Vikhamar Schuler (for ver. 5., 6. and 7.)
- **Extended Kalman Filter for surface assimilation using SURFEX v.5**
coupled
with 3DVAR (with ALARO physics).
Contact: Annelies Duerinckx
- **Lake temperature initialization tool (FA,LFI):** Author Gergely bölöni (FA) Laszló Kullmann (LFI). It replaces surface temperature of lake points by prescribed value (e.g. obs) within a prescribed area.