

E-GVAP

1st expert meeting on the use of ground-based GNSS data in NWP and now-casting

DMI, February 27, 2007.

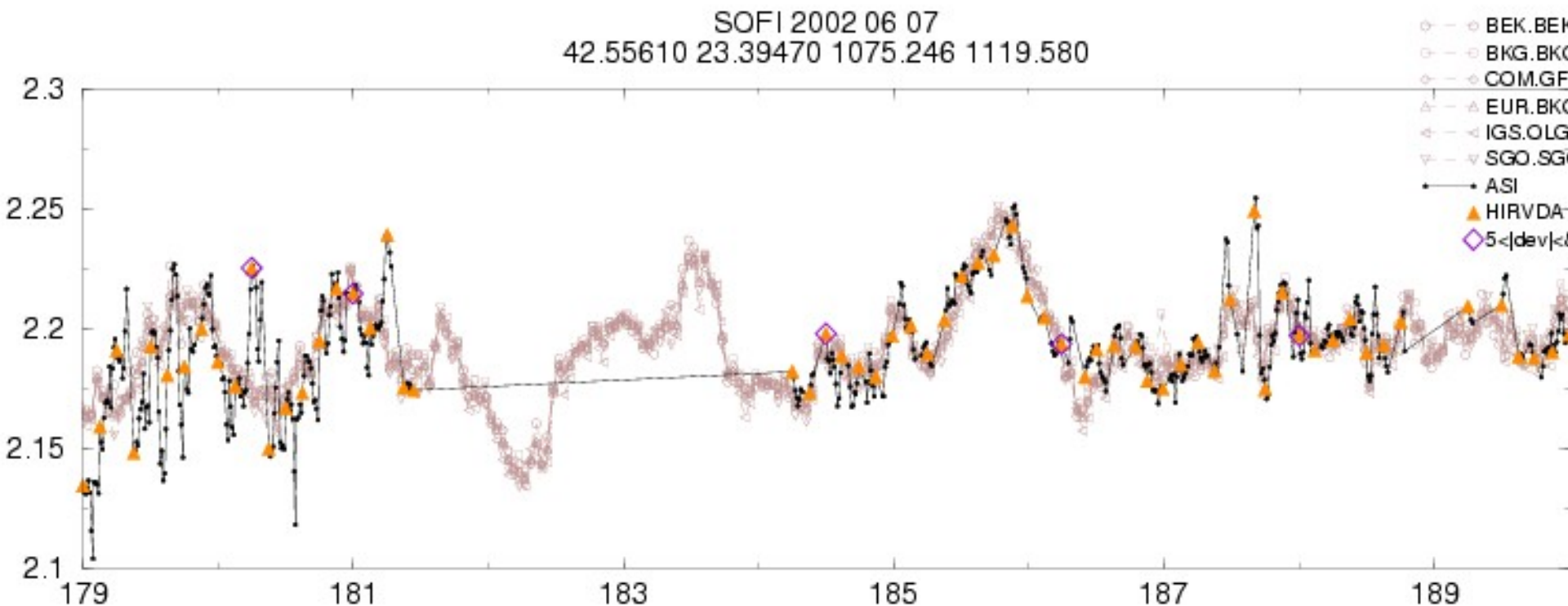
Agenda

1. Welcome, practicalities. Travel re-imburement.
2. Current and planned use of ground based GPS data each institute presented by each expert. (In addition to this we will have available information about the use of ground based GPS data at E-GVAP institutes not represented at the meeting, via the E-GVAP plenary meeting that is held next week)
3. Discussion of methods and results for screening, bias-correction, data assimilation, that we know of and find relevant, and that was not already discussed under the first point. (Don't save for 2 when planning for 1.)
4. Discussion of methods and results for using ground based GPS data by other means than data assimilation. In particular IWV maps made for now-casting
5. Defining most urgent open issues relevant to operational and near operational meteorology. How can be by exchange of information and collaboration solve them.
6. User requirements.
 1. Timeliness criteria. Valid time. "Averaging" time. File format. Data distribution method
7. Best way of reporting to E-GVAP institutes and further our findings and to implement in E-GVAP daily work and data-base handling.
8. Other (feel free to add).

Coffee 1, lunch, coffee 2. Start of lunch in the 12 to 12:30 interval.
End of meeting by 16:00.

DMI, past impact results

An example of data quality and validation problems



DMI plans

1. Setup extraction of O-B and O-A statistics from passive assimilation.
 2. Use ZTD for continuous validation of HIRLAM
 3. Exchange data with everybody interested/willing (KNMI, INM, ..)
 4. Based on that devise preprocessing/data selection algorithms enabling selection of "good and robust" ZTD data for assimilation.
 - Both processing centre and station dependent investigation.
 5. Run impact experiments in parallel mode.
 6. Start operational assimilation of NRT ZTD
- Timescale: This year.

- Perform long term statistical analyses to monitor in detail short and long term variations of NRT ZTDs relative to other data (alternative NRT ZTD, post processed, NWP, radiosonde, WVR, solar spectograph).

Status for HIRLAM members not here

SMHI. No work foreseen in 2007.

FMI mainly work on slant delays. To implement bias correction operator to cost function during 2007.

Ireland, Iceland, Norway. No work on use of ZTD/IWV data.

HIRVDA (HIRLAM data assimilation)

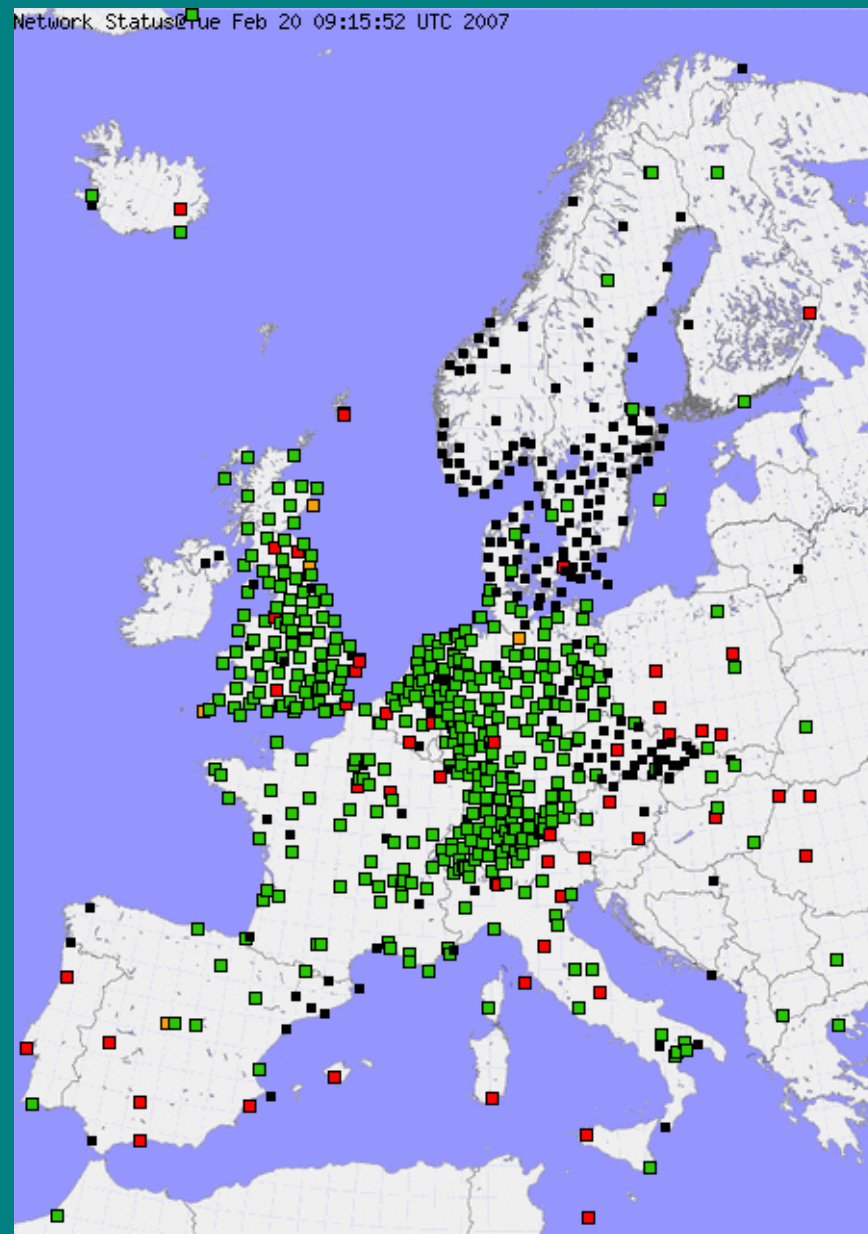
Recent planning meeting ultimo February.

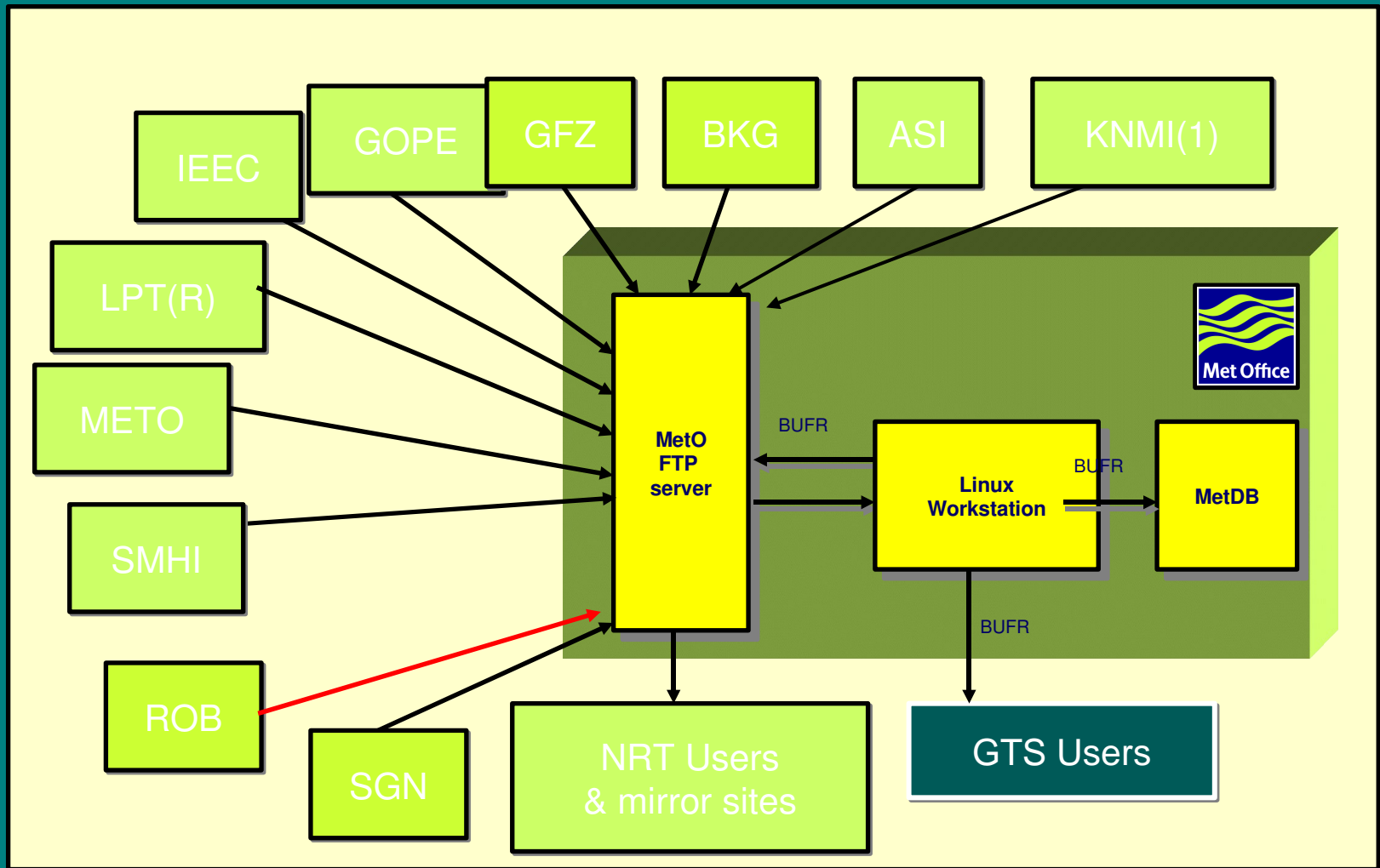
Expressed willingness from HIRLAM management to collaborate with other European NWP groups.

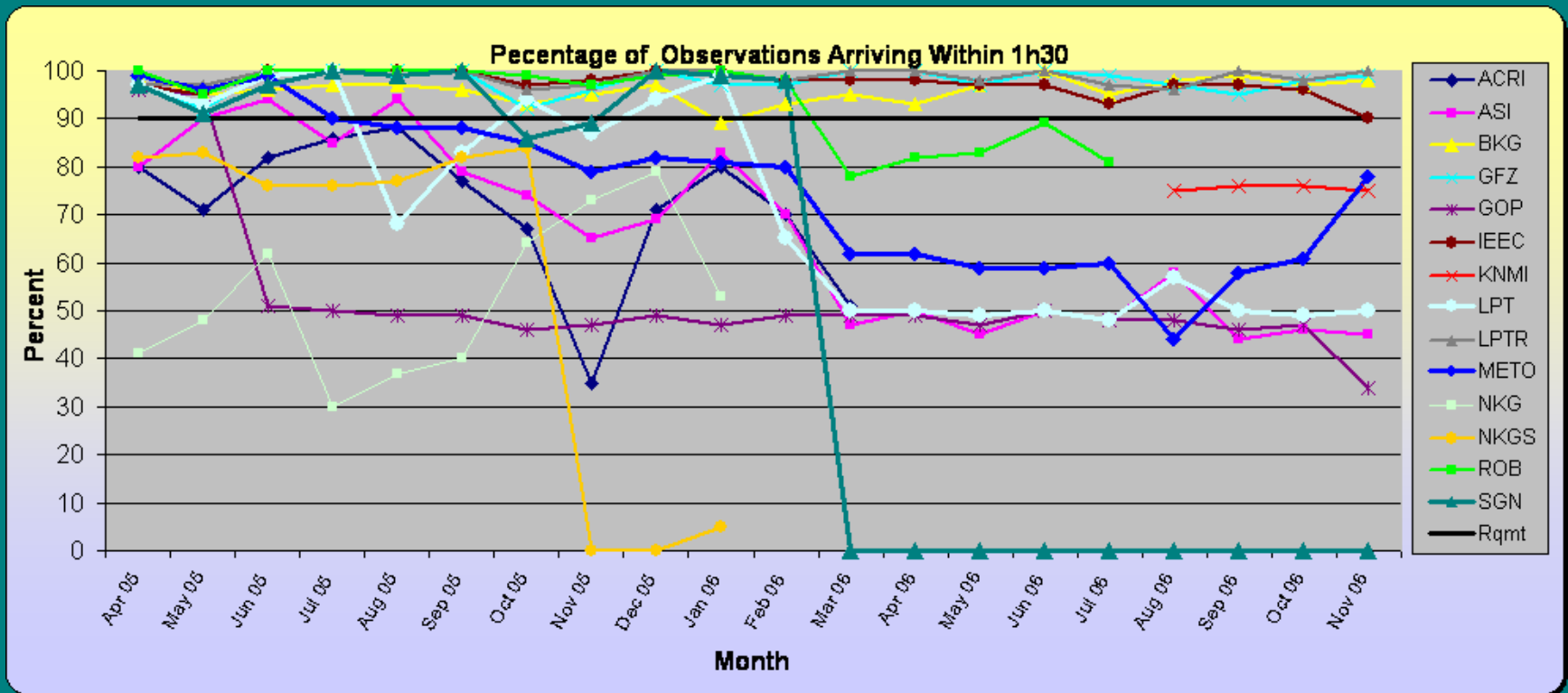
3. Work on preprocessing/ZTD data selection algorithms. Time scale "now"
 - Exchange of offset statistical data (O-B and O-A) from passive assimilation.
 - Check of ZTD TL and AL operator (related to convergence problems)
 - Inclusion of new control variable for humidity in HIRVDA (improved version of current ECMWF renormalisation method, possibly related to convergence problems(?), not done by "us").
4. Assimilation impact experiments. Timescale toward end of year.
5. Combined assimilation experiments including 2mRH and Seviri data (high level "integrated" humidity). Timescale beginning of next year. Both 2mRH and Seviri are on a stage compared to ZTD regarding assimilation into HIRLAM, i.e. the operator is there, but additional work is necessary prior to operational use.
6. Implementation of method for bias correction via cost function (FMI, timescale 1 year, independent of above).

NRT ZTD data availability

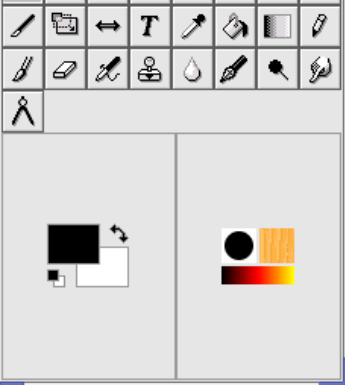
- EUMETNET programme E-GVAP coordinating collection and processing of "European" GNSS data into ZTD in near real-time (present goal is processing in hourly bins with the oldest data being of age 1 h 30 min when they become available).
- Time resolution: 2 to 12 ZTDs per hour.
- Some processing centres have started "real real-time" processing







By Dave Offiler. Available via validation link on E-GVAP website

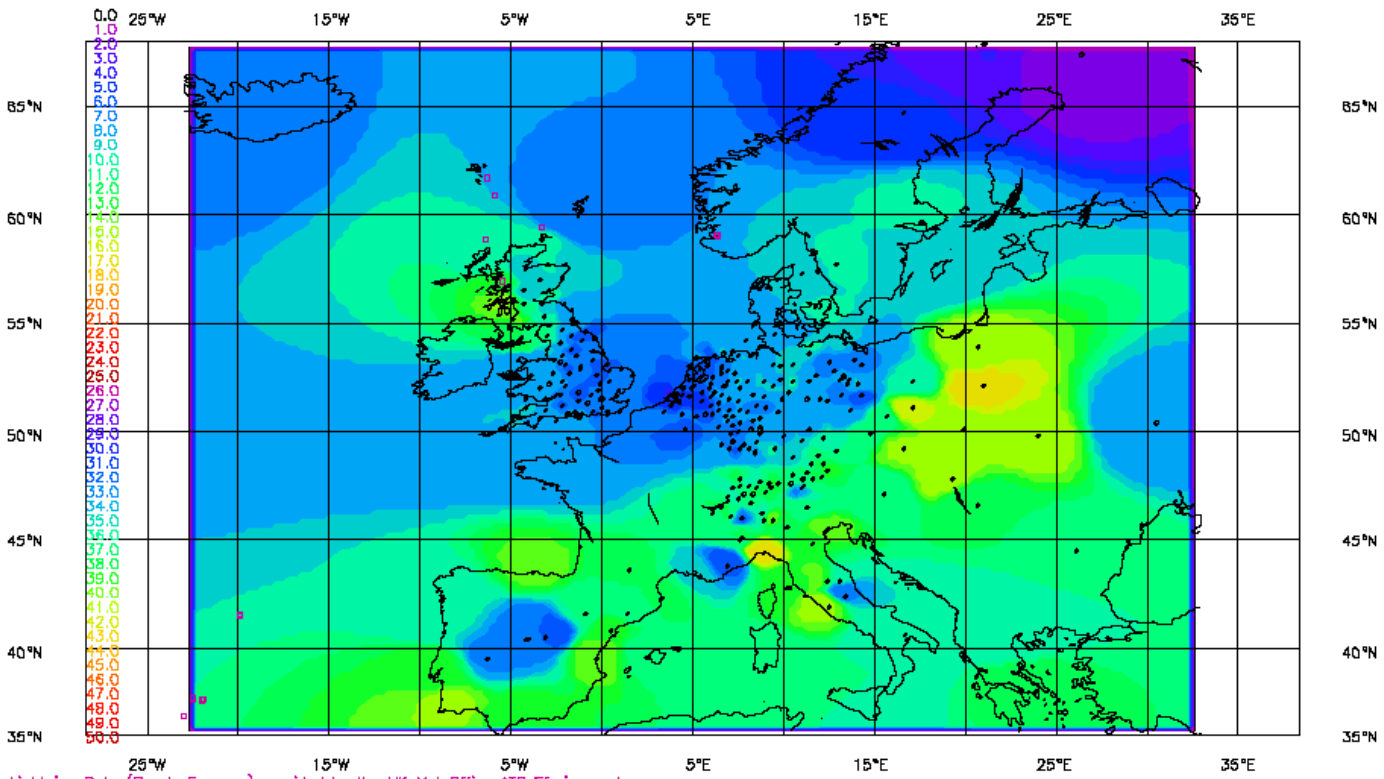


purple squares are lightning events observed by ATD
UNIX/LINUX users browsing with Mozilla/Seamonkey should clean regularly the \${HOME}/.java/deployment/cache/javapi/v1.0/file/

Start < > Set Animation Speed

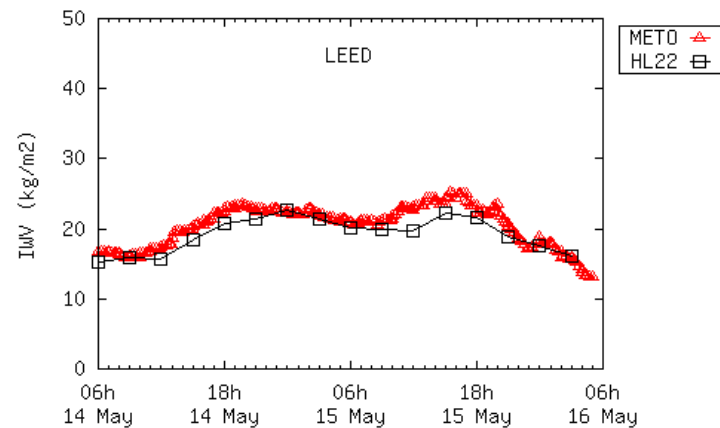
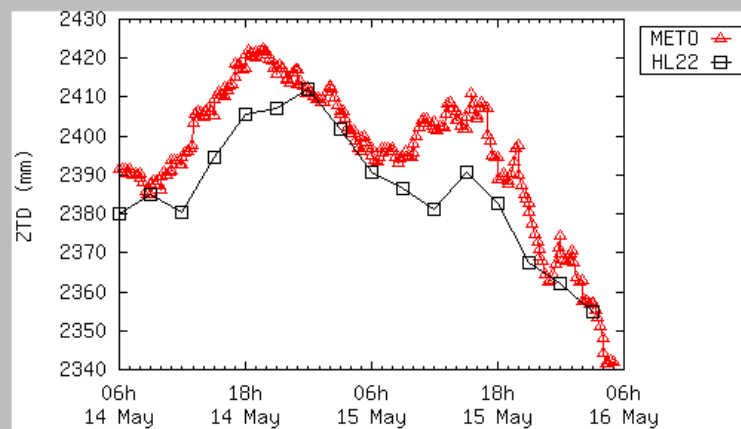
Left click - toggle on/off; Right click - show frame

GPS IWW 2007011409 UTC - 2km winds



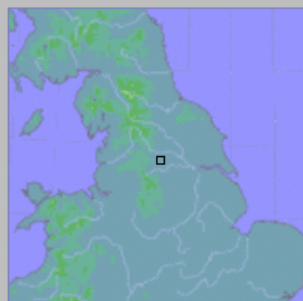
Lightning Data (Purple Squares) provided by the UK Met Office ATD Sferica system

- Programme plan
- Calendar
- E-GVAP meetings
- Reports
- Publications
- Documents
- Links



created: 16/05 06:32

(c) KNMI/EGVAP



Graphical location of the site

latitude	53.80020
longitude	-1.66379

HIRLAM(KNMI) AN - GPS ZTD

7day stat. 2006/05/09 - 2006/05/15

AC	num	bias	RMS	stddev
METO	51	-5.5	13.1	11.9

Notes

- Statistics are updated daily
- GPS ZTD are interpolated to NWP analysis time

HIRLAM(KNMI) FC - GPS ZTD

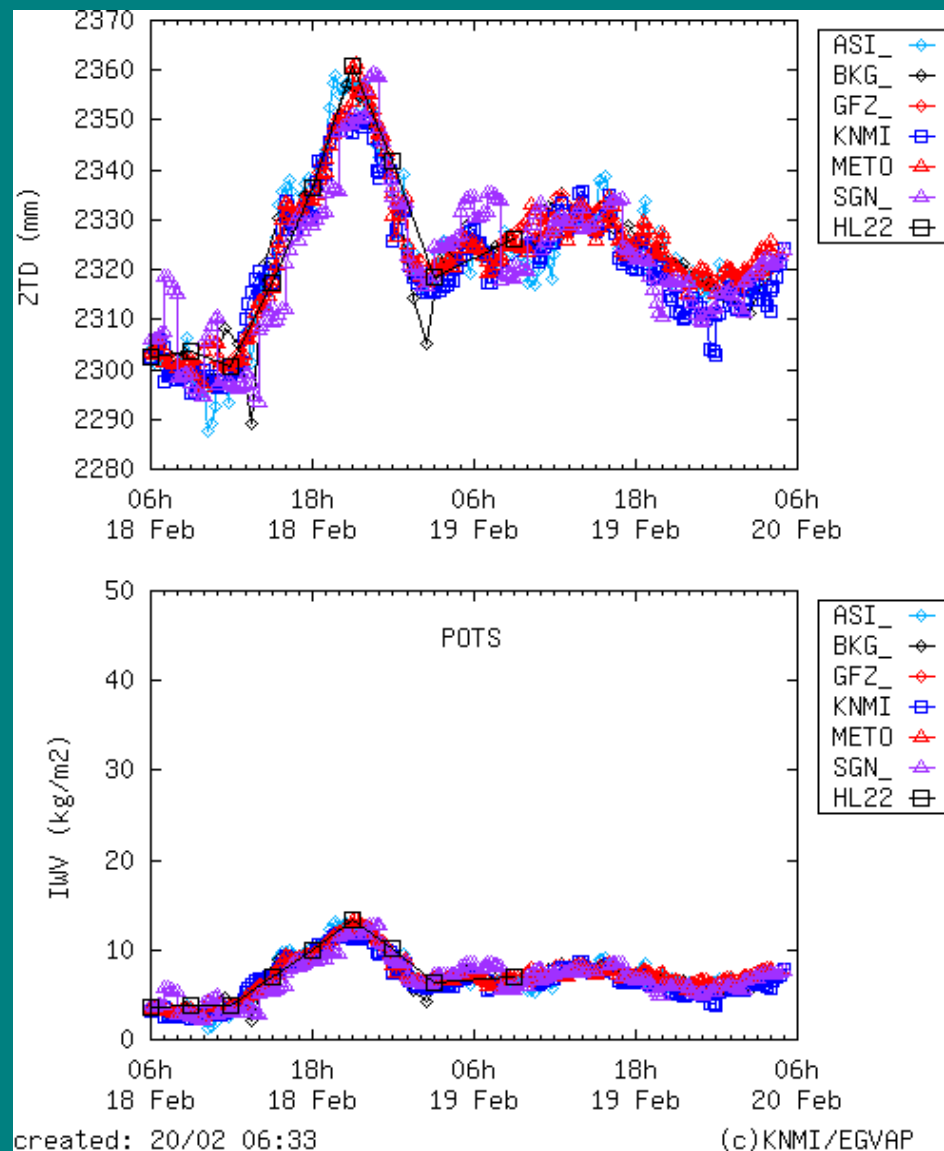
Latest Obs. vs NWP-forecast

AC	Obs.time	FC.time (sec)	HIRLAM-GPS
METO	08:00	7200	0.0
METO	08:15	8100	-1.6
METO	08:30	9000	-2.4
METO	08:45	9900	-0.3
METO	08:59	10740	2.2

Notes

- Statistics are updated hourly
- NWP-FC ZTD are interpolated to GPS observation time

By Siebren de Haan. Available via E-GVAP homepage under "validation"



Assimilation of GNSS ZTDs

Software for assimilation of ZTDs in HIRVDA.

- Observation operator very fine.

Neutral to positive impact in many impact studies on various platforms, but occasional 'hickups' that prevent current operational right away.

Remaining issues prior to operational use:

- Preprocessing
 - screening
 - bias correction
- Quality control
- Convergence of cost function minimisation
- New HIRVDA control variable for humidity (also of importance for Seviri data, but less crucial).
- Input format (currently ascii hirvda only format).
- Homogeneity of ZTD product
 - Different processing methods (but similar results when OK)
 - Different time resolution (response time to real atmospheric variations)

Future

- INM. Currently passive monitoring
- KNMI. Monitoring been set up recently.
- DMI. Monitoring to be set up soon. Impact experiments later this year
- FMI , SMHI , met.no ?

Work is being done, with proper coordination (and proper data) operational use should be feasible this year.

Meteo-France and UK Met Office already do operational assimilation of ZTDs.

GPS RO: EUMETSAT fellow position open at DMI.