



E-GVAP Activities at ASI/CGS

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Tropospheric solutions to E-GVAP

4 solutions delivered to E-GVAP

ASI_

Available from June 2001
Input: hourly RNX files/IGU
Update cycle: hourly
Purpose: NWP data assimilation

Operational

4 scores per hour every 15min
COSTV2.0/ZTD + gradients

ASIC

Available from November 2008
Input: hourly operational cost solutions
Update cycle: hourly
Purpose: NWP data assimilation + QC

Operational

4 scores per hour every 15min
COSTV2.0/ZTD

ASIS

Available from January 2014
Input: RT GNSS observation/IGS RT
Update cycle: 15min
Purpose: test RT obs+prod in sub-hourly PPP for nowcasting

Test

2 scores per sub-h solutions
COSTV2.2/ZTD + gradients

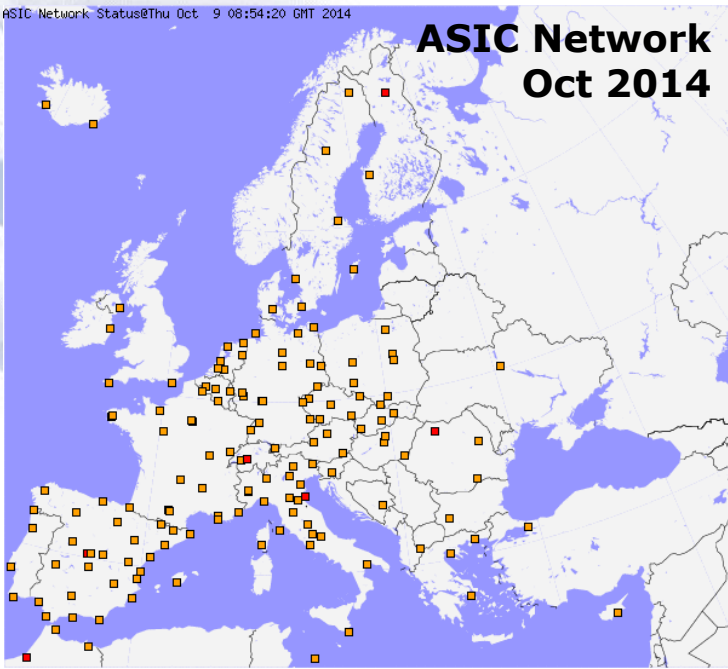
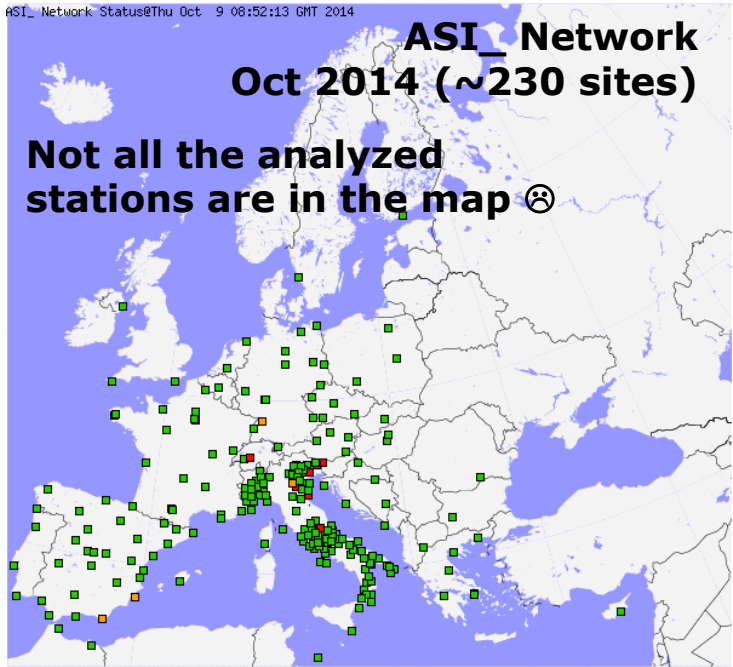
ASIR

Available from March 2014
Input: Hourly RNX files/IGS RT
Update cycle: hourly
Purpose: test IGS RT prod in hourly PPP for NWP

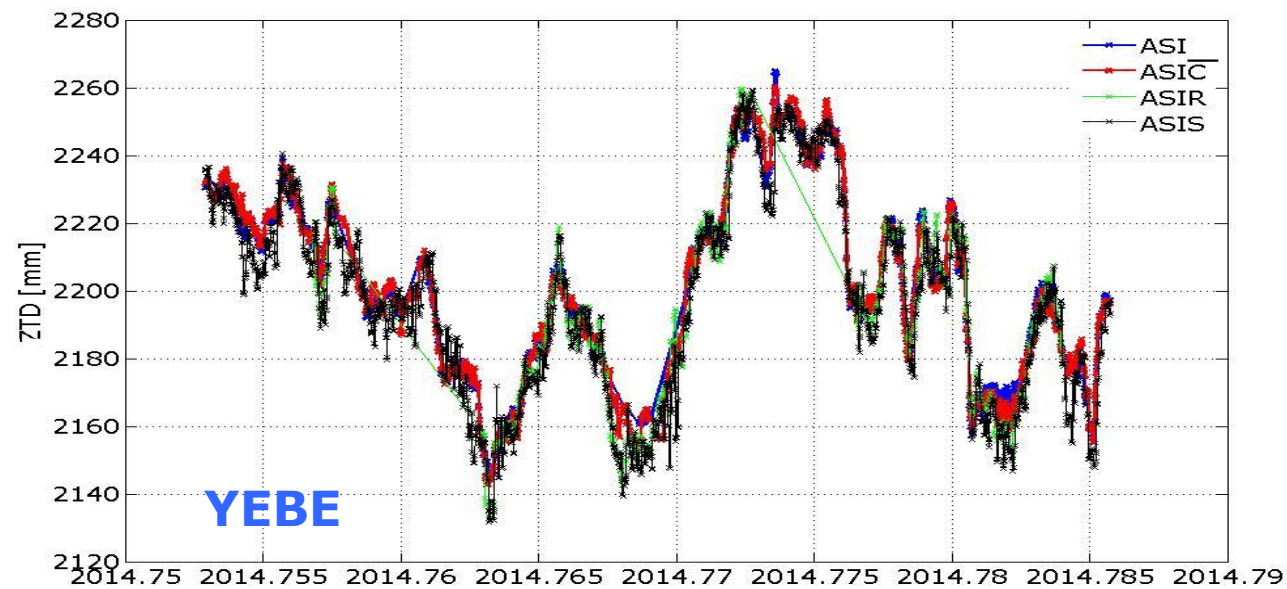
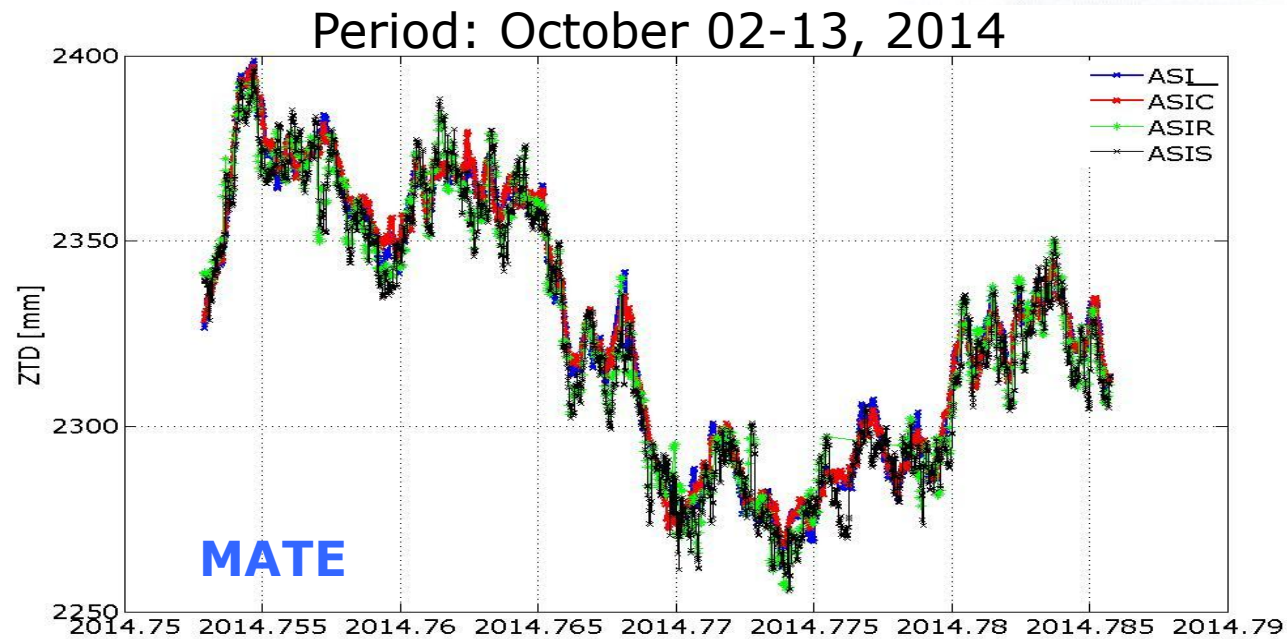
Test

4 scores per hour every 15min
COSTV2.2/ZTD + gradients

GNSS Networks analyzed for E-GVAP



ZTD time series ASI_, ASIC, ASIR and ASIS



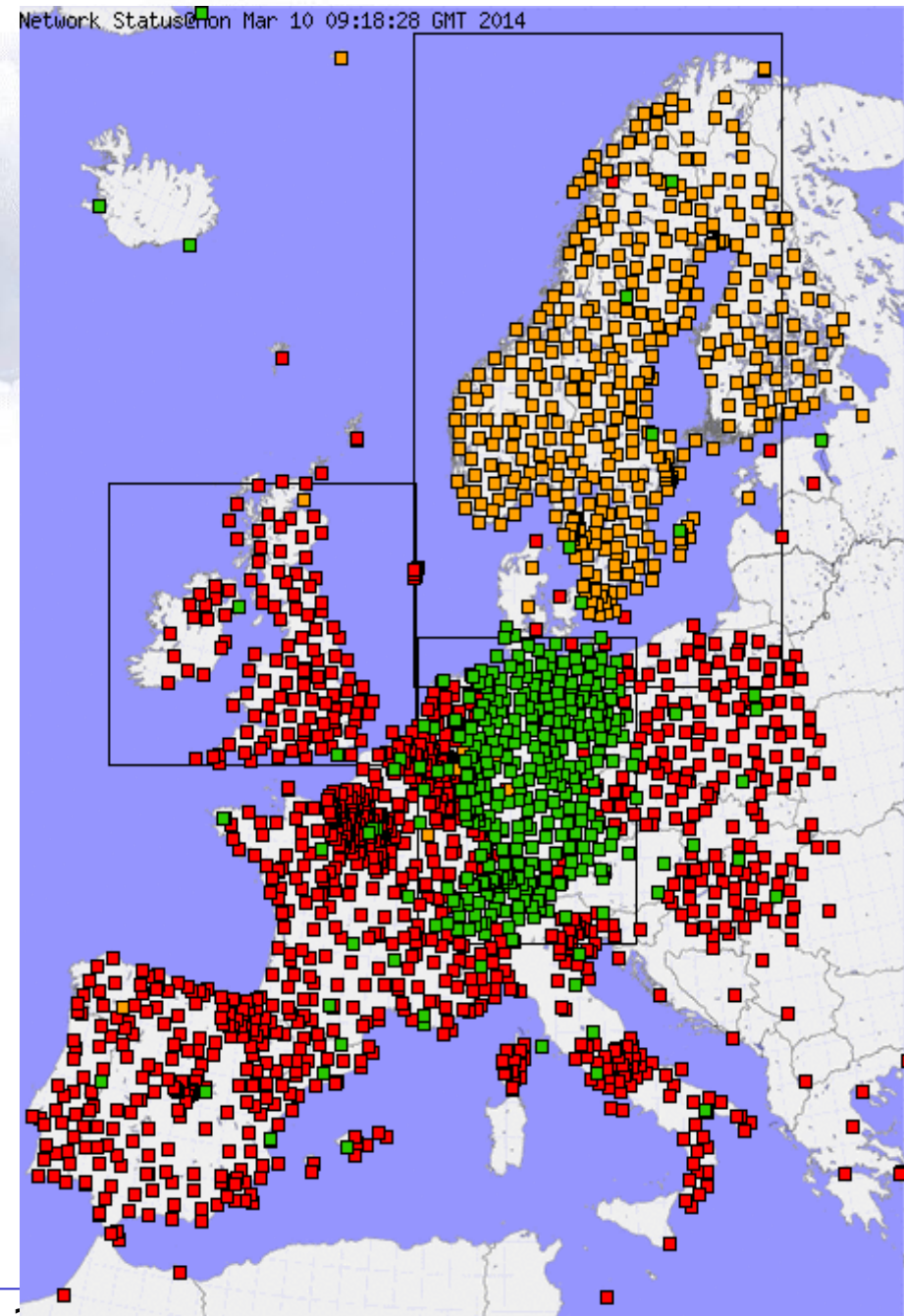
IGS Outage March 2014

Red sites did not provide ZTDs, due to IGU orbits not being available.

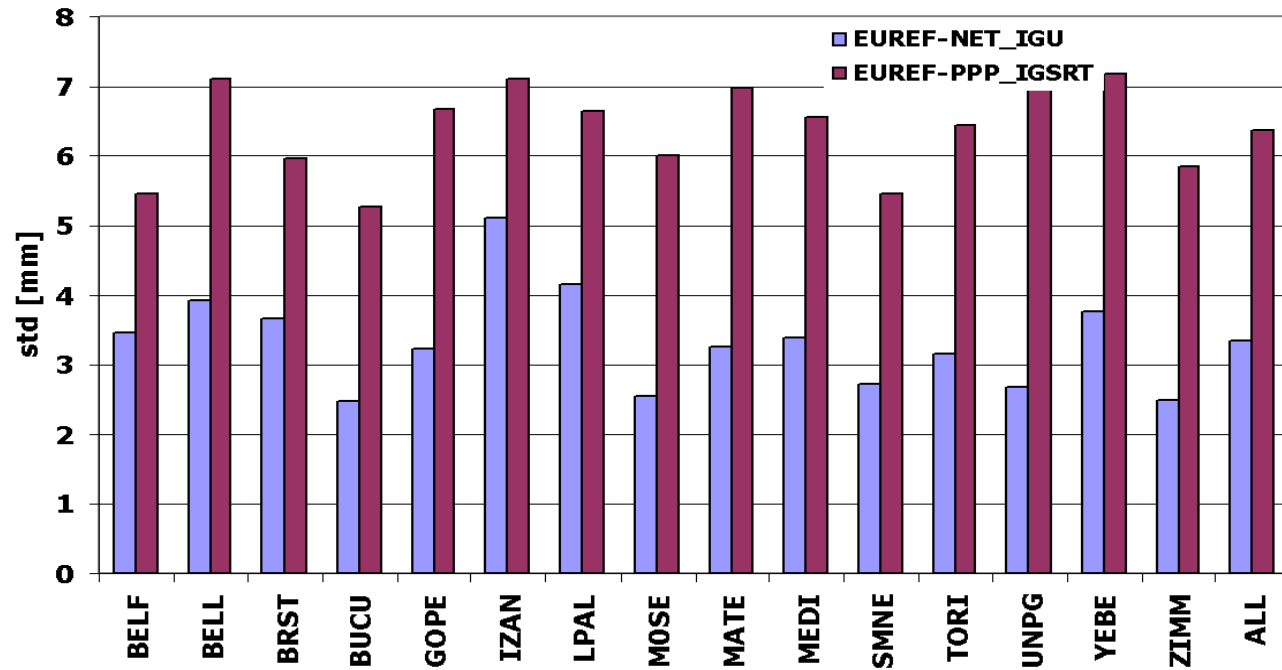
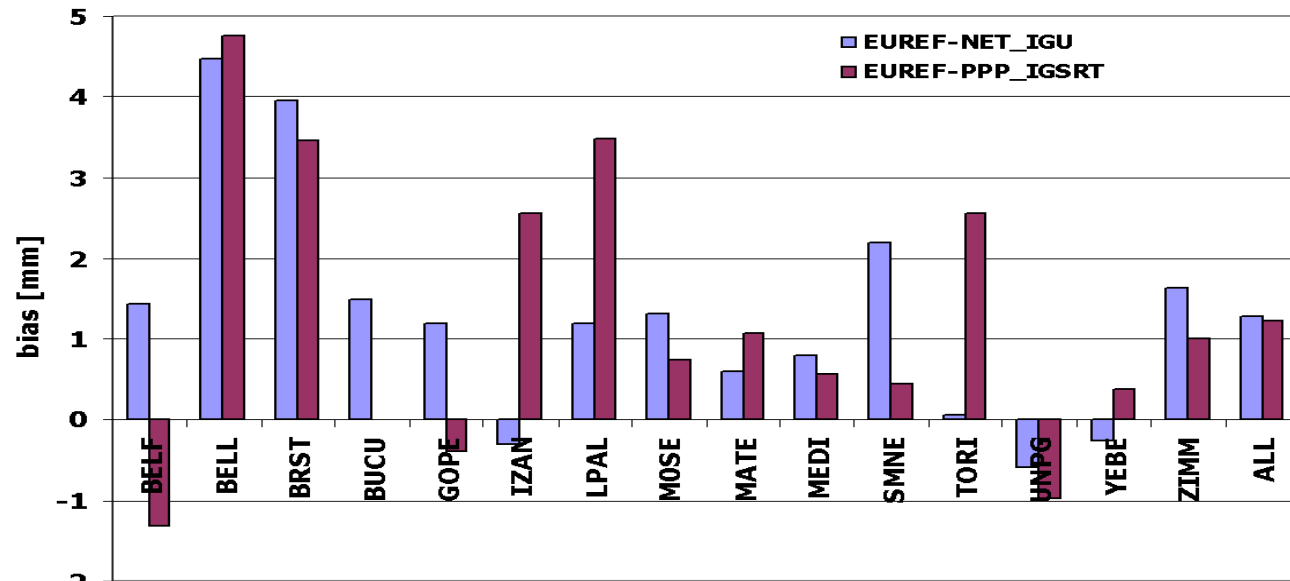
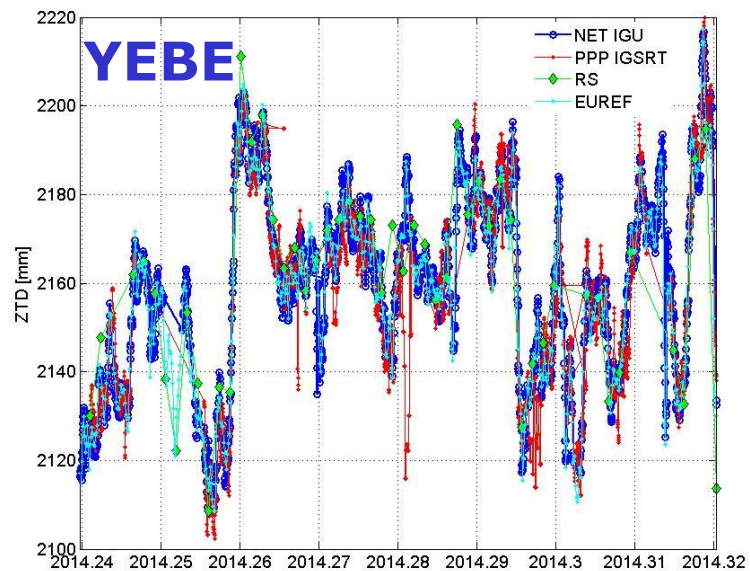
Orange sites did provide ZTDs, based on ppp solution, but with a delay (not related to IGS outage)

Green sites processed by LPT (Swiss) using CODE orbits in a network mode and GFZ (Germany) using its own orbits and clocks in PPP.

But IGS RT products were available



ASIR performance



Tropospheric solutions beyond E-GVAP

3 solutions delivered to EUREF

ASI

From 2001
Input: daily RNX files of ASI LAC EPN sub-network/IGS final
Update cycle: daily
Purpose *climate monitoring*
12 scores per day every h
SINEX/ZTD + gradients

EUR

From July 2014
Input: daily operational EPN LAC solutions
Update cycle: daily
Purpose *climate monitoring + QC*
12 scores per day every h
SINEX/ZTD

Repro2

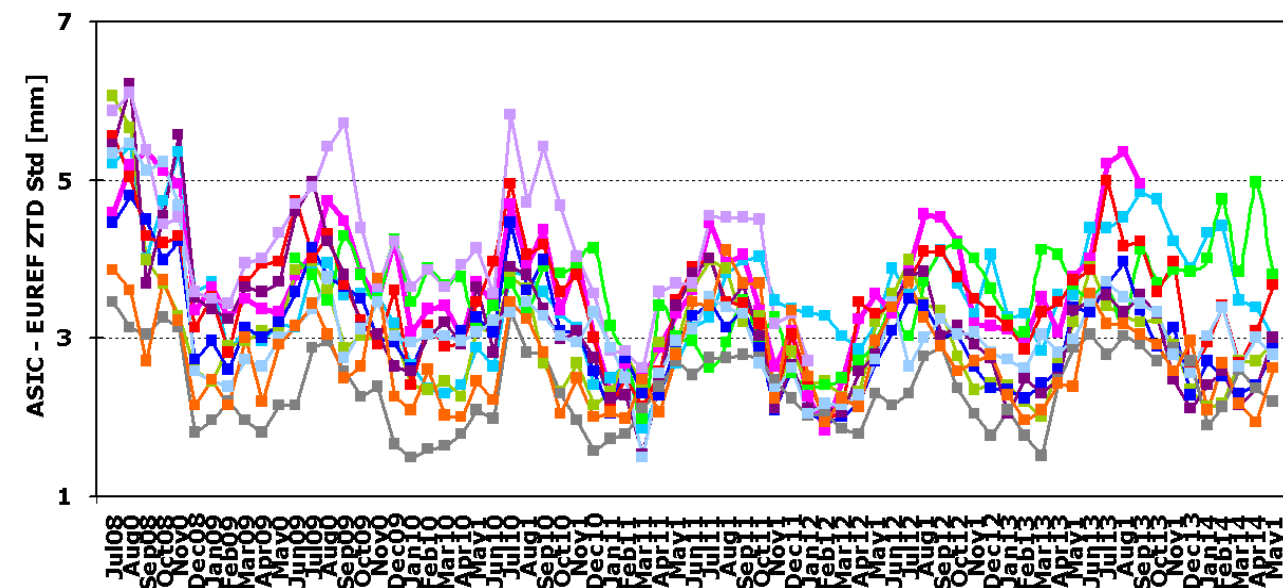
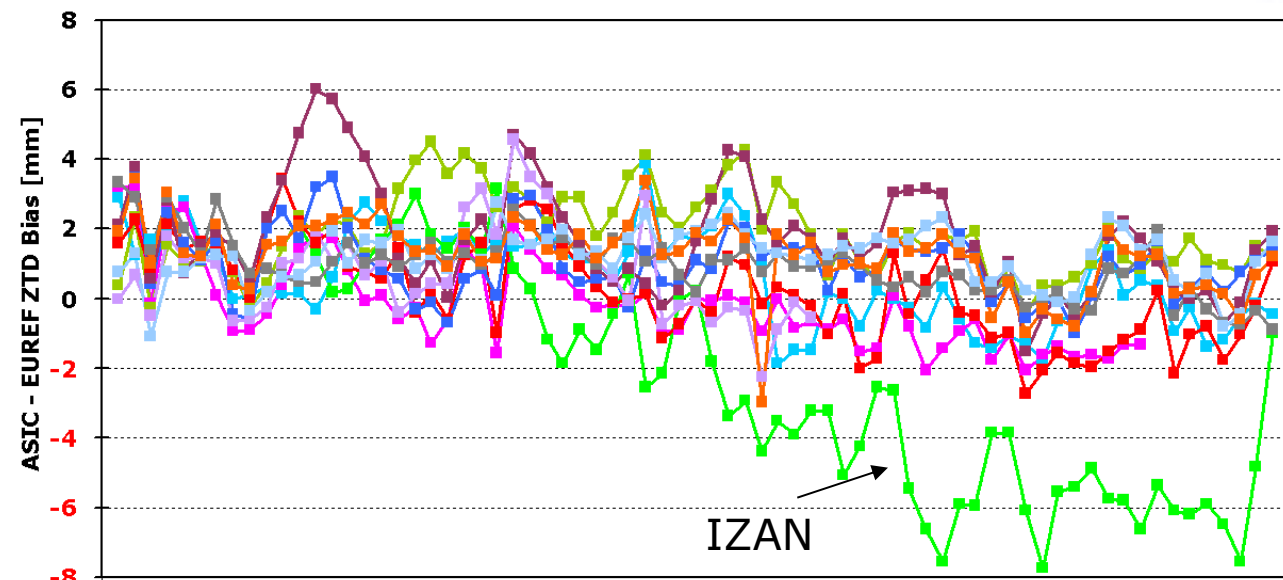
Available from 1996
Input: daily RNX files of EPN network/IGS final
Update cycle: daily
Purpose *climate monitoring*
12 scores per day every h
SINEX/ZTD + gradients

1 solution for internal use only

ASIP

Available from 2000
Input: daily RNX files of Italian network/JPL final
Update cycle: daily
Purpose *coordinates monitoring*
scores every 5min
SINEX/ZTD + gradients

E-GVAP Combined versus EUREF combined



— BRST — CAGL — GOPE — IZAN — MATE — MOSE
— MEDI — MILO — ONSA — YEBE — ZIMM



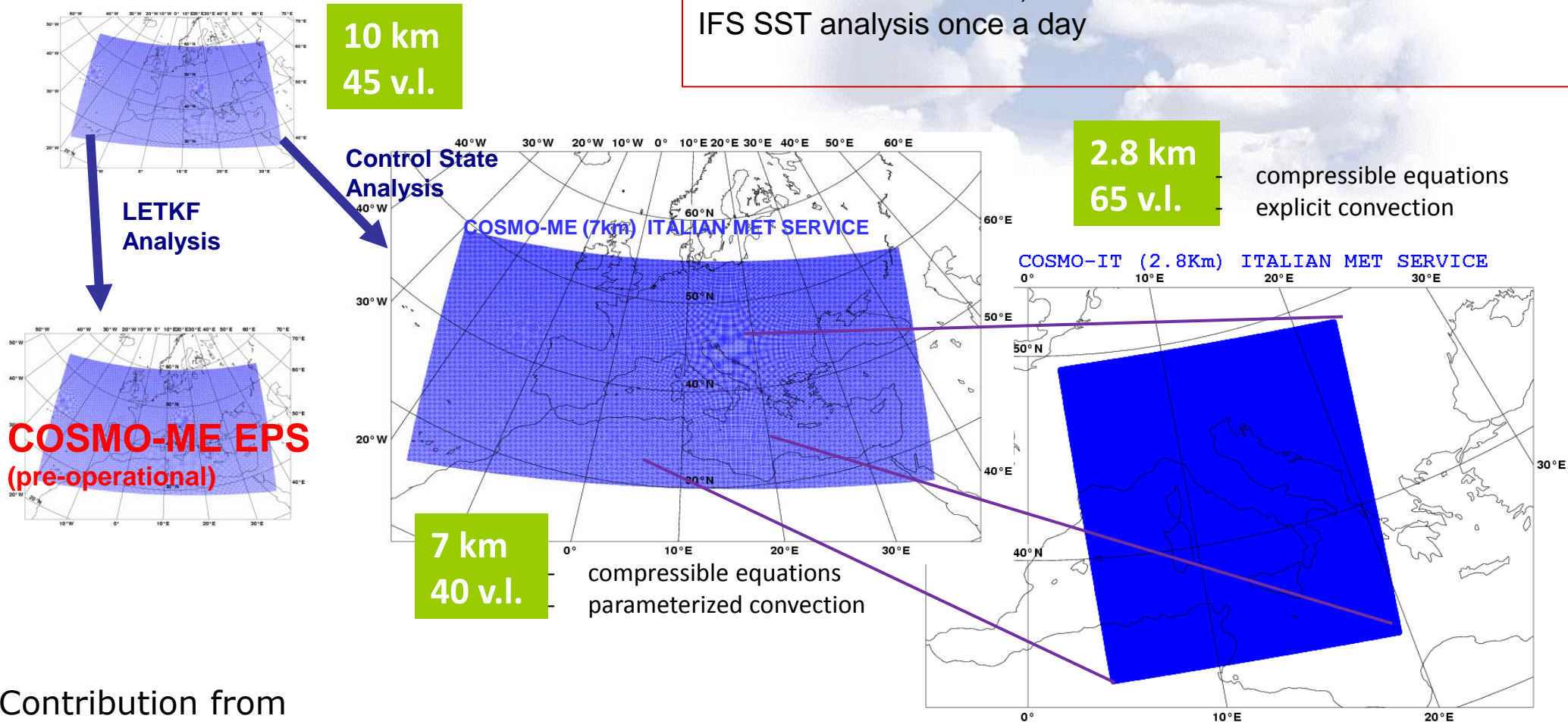
Same sw used for NRT
E-GVAP & daily EUREF
combination from GPS
week 1800 (06 July
2014)

[Pacione et al., JASR 47 (2011) 323–335]

CNMCA NWP SYSTEM since June 2011

LETKF analysis ensemble (40+1 members) every 6h using
RAOB (also 4D), PILOT, SYNOP, SHIP, BUOY, Wind Profilers,
AMDAR-ACAR-AIREP, MSG3-MET7 AMV, MetopA-B/Oceansat2
scatt. winds, NOAA/MetopA-B AMSUA/MHS/ATMS radiances
+ Land SAF snow mask,
IFS SST analysis once a day

Ensemble Data Assimilation:

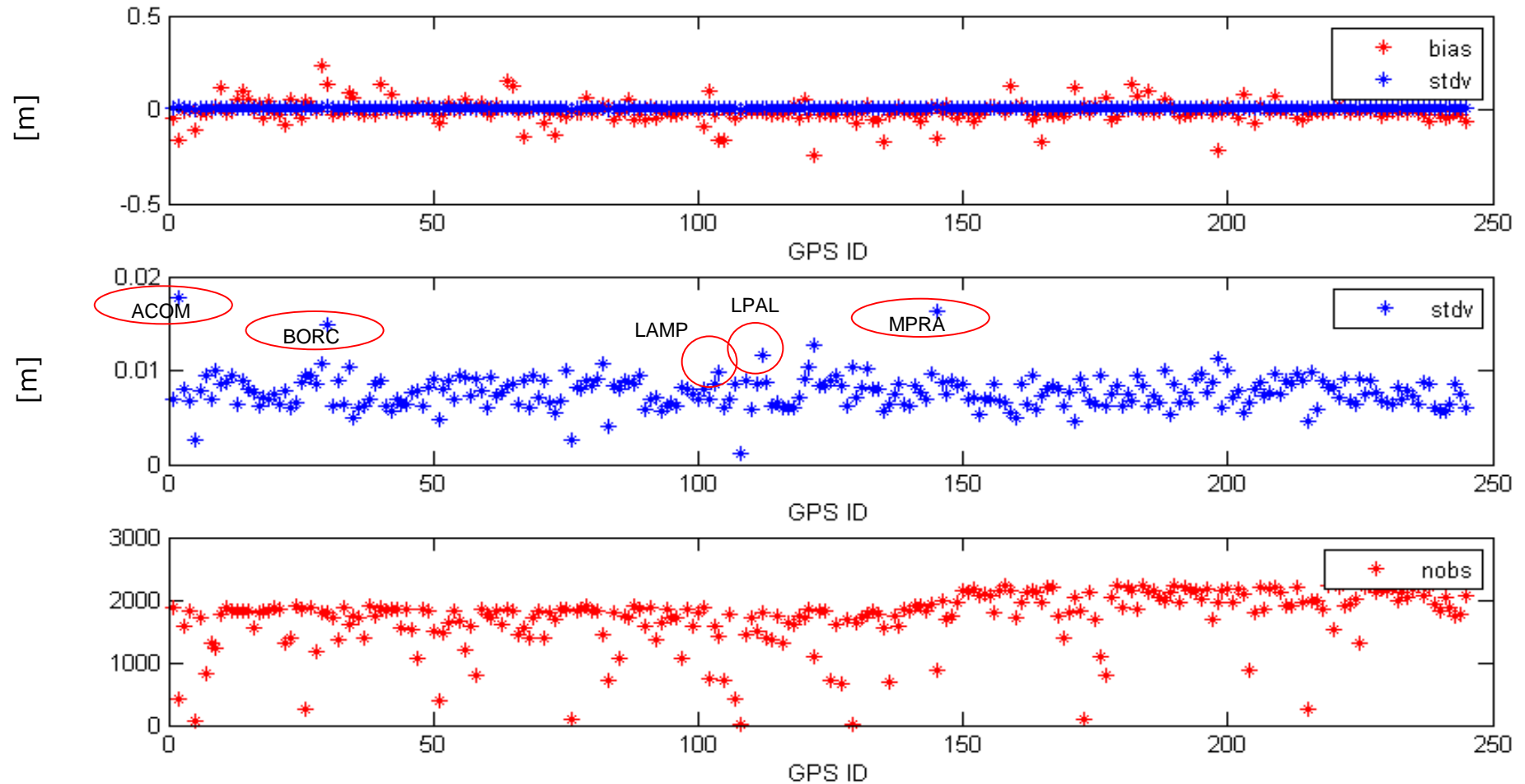


Contribution from
Lucio Torrì and Francesca Marcucci
Centro Nazionale di Meteorologia e Climatologia Aeronautica (CNMCA), Italian National Met Center

Italian GPS stations monitoring statistics (ZTD)

Monitoring using CNMCA-LETKF system

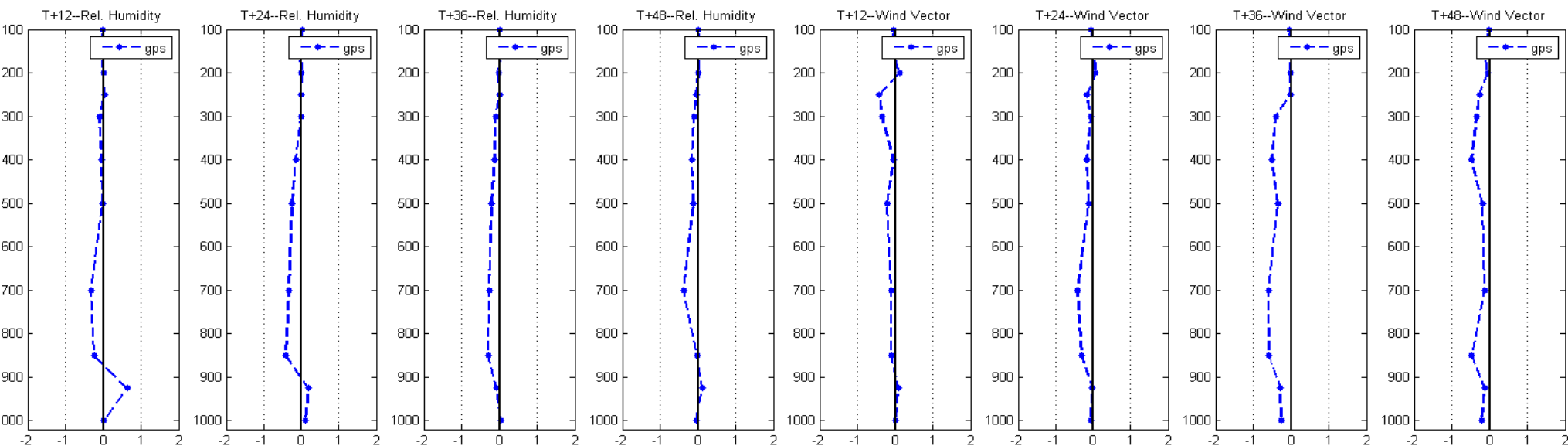
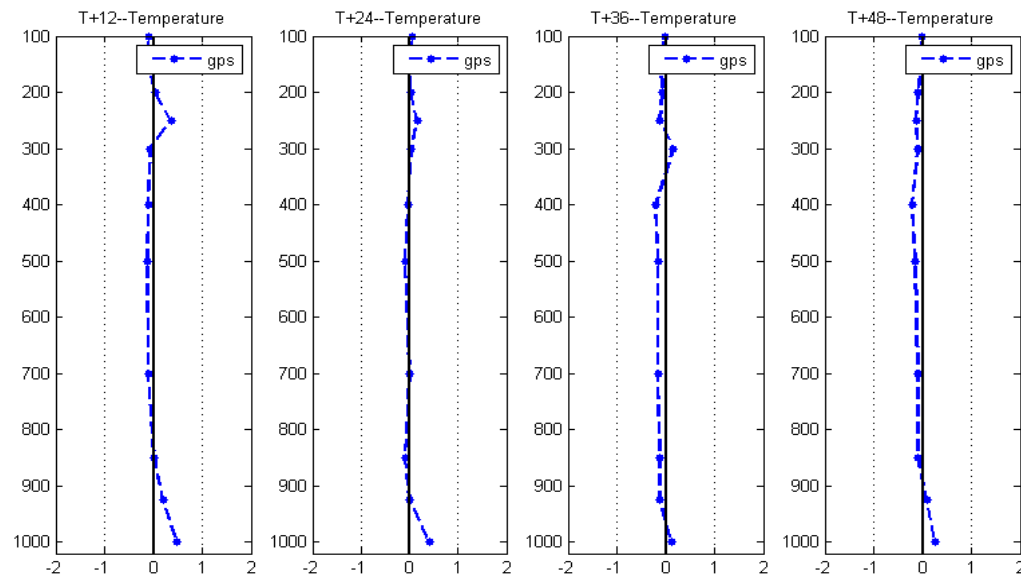
Period : February 01-28, 2014



GPS Station Assimilation

Thinning=60km

Relative difference (%) in RMSE
computed against IFS analysis
for 00 UTC COSMO runs from
11-01-2014 to 30-01-2014
negative value = positive impact



Roadmap for next years

Further develop the E-GVAP processing systems

- **ASI_** Network densification (including as many as possible Italian stations)
- **ASI_** and **ASIC** move to COST V2.2 format but it needs to be coordinated among all the ACs!!!
- **ASIC** reduce the latency? It starts at hh+1:30
- Willing to include more stations in **ASIS** and **ASIR** solutions if needed
- Continue the cooperation with the Italian Met Center

Tropo Activities beyond E-GVAP

- EPN routine combination + Repro2 combination and validation
- GNSS4SWEC related activities (mainly WG1 and WG3)