

# ROB's Analysis Centre

CONTRIBUTION TO E-GVAP

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# General Processing Parameters: Status

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## Maintenance + Bug fixes + RNX V3

- ▶ Bernese GNSS Software v 5.2.
- ▶ IERS standards 2010.
- ▶ Troposphere Model:  
GMF dry as a priori / Estimation of the GMF wet.
- ▶ Atmospheric Tidal Loading (ATL) applied.
- ▶ GPS + GLONASS observations.
- ▶ IGV Ultra-rapid orbits and ERPs (fall back to IGU and/or CODE possible).
- ▶ Updated FES2004 coefficients for the Ocean Tide Loading (OTL).
- ▶ Products in **COST-716 Format 2.2a** and **new file naming convention**.

	Status	GTS
ROBH	Operational	Yes
ROBT	Test ⚠	No
ROBG	Operational	Yes
ROBQ	Operational	Yes

# ROBH for European NWP Models D.A.

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Status: 12 November 2019 (Several stations are located outside the represented domain).

Targeted Application: regional NWP

European Network

~687 GNSS Stations

GPS+GLO, 2 HRS arc + Stacking



ZTD-Only

15-min Sampled ZTD

Hourly Update Cycle

Comp. ~20min - Latency ~ 37min (95% C.I.)

Uploaded to E-GVAP

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# ROBT for tuning ROBH and Test D.A. Purposes

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Status: 12 November 2019 (Several stations are located outside the represented domain).

Targeted Applications:  
Global NWP D.A.

Mainly EPN + National Network stations

~800 GNSS Stations

GPS + GLONASS, 2 HRS arc + NEQ Stacking



ZTD-Only

15-min Sampled ZTD

1-Hour Update Cycle

Comp. ~47 min - Latency ~ 66 min (95% C.I.)

COST Format 2.2a

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# ROBG for Global NWP Models D.A.

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Status: 12 November 2019 (Several stations are located outside the represented domain).

Targeted Applications:  
Global NWP D.A.

Mainly IGS stations

~314 GNSS Stations

GPS + GLONASS, 4 HRS arc, no Stacking



ZTD-Only

15-min Sampled ZTD

1-Hour Update Cycle

Comp. ~20 min - Latency ~ 55 min (95% C.I.)

COST Format 2.2a

Uploaded to E-GVAP

➤ ROBG's Contribution to E-GVAP



# ROBQ for (NWP) Nowcasting (D.A.)

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Status: 12 November 2019 (Several stations are located outside the represented domain).

Additional real-time/highrate GNSS observations from Luxembourg, north of France, Germany, Denmark can be useful.

Targeted Applications:  
rapid-update NWP and nowcasting

National Networks + EPN stations

~259 GNSS Stations

GPS + GLONASS, 4 HRS arc, no Stacking



ZTD-Only

15-min Sampled ZTD

15-Min Update Cycle

Comp. ~12 min - Latency ~ 13min (95% C.I.)

COST Format 2.2a

Uploaded to E-GVAP

Only the last 15 minutes !!!

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# Plans

FOR 2020+...

# Plans, Questions & Discussions

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- ▶ **Shorter-term** plans: space for **improvements and optimisations** remains and will be investigated.
- ▶ **Long-term** plans: investigate the production of horizontal **gradients** and **slant delays** in hourly analysis + real-time production?
- ▶ **Feedback** (e.g. O-B graphs such as Météo France) can be very usefull, particularly if these are station per station!
- ▶ **Authenticating users** of our products becomes more and more essential to sustain our activities as analysis centre! (e.g. we need to justify the running cost of such service) → how to achieve that?



# Nomenclature of the ROB solutions

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ROB has 5 processing systems and provides solutions from 4 of them to E-GVAP:

<b>ROBH</b>	<p><i>Input:</i> Hourly RINEX files</p> <p><i>Update cycle:</i> Hourly</p> <p><i>Purpose:</i> European NWP data assimilation</p>	<p><b>Operational</b></p> <p>~ 687 stations</p> <p>Proc. time: 20-25 min.</p>	BSW 5.2 GPS+GLO
<b>ROBQ</b>	<p><i>Input:</i> Real-time GNSS observations (NTRIP)</p> <p><i>Update cycle:</i> Sub-hourly – every 15 Minutes</p> <p><i>Purpose:</i> Nowcasting + rapid-cycle NWP data assimilation</p>	<p><b>Operational</b></p> <p>~ 259 stations</p> <p>Proc. time: ~ 8-13 min.</p>	BSW 5.2 GPS+GLO
<b>ROBT</b>	<p><i>Input:</i> Hourly RINEX files</p> <p><i>Update cycle:</i> Hourly</p> <p><i>Purpose:</i> Tests + prepare next ROBH</p>	<p><b>Tests (for R&amp;D)</b></p> <p>~ 802 stations</p> <p>Proc. time: ~ 30 min.</p>	BSW 5.2 GPS+GLO
<b>ROBG</b>	<p><i>Input:</i> Hourly RINEX files</p> <p><i>Update cycle:</i> Hourly</p> <p><i>Purpose:</i> Global NWP data assimilation</p>	<p><b>Operational</b></p> <p>~ 314 stations</p> <p>Proc. time: ~ 10-14 min.</p>	BSW 5.2 GPS+GLO
<b>ROBP</b>	<p><i>Input:</i> Daily RINEX files</p> <p><i>Update cycle:</i> Daily (latency of 6 days)</p> <p><i>Purpose:</i> CRD + validation + prepare for re-analysis</p>	<p><b>Internal only</b></p> <p>~ 1338 stations</p> <p>Proc. time: 16-20 hours</p>	BSW 5.2 GPS+GLO

➤ Conclusions and Plans