New application for SKPOS quality control

Karol Smolík

<u>Geodetic and Cartographic Institute BRATISLAVA</u>

karol.smolik@skgeodesy.sk

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Introduction

- **S**K*POS*® - most used service within the geodetic control services

- Permanent operation = archiving a lot of data

- Many projects are supported by data from **S**K*POS*®:
  - EPN, IGS, EUREF densification
  - Cross border data exchange
  - Space emergency system
  - E-GVAP programme
  - …

SKPOS quality control

- Application allows automateddata analysis and visualization
- Inputs:
  - RINEX, SINEX, Real-Time Delay data
- Outputs:
  - Tables and charts:
    - Position Time Series
    - Observations, cycle slips, multipath
    - Skyplots
    - RINEX data availability
    - Real-Time delay of data from stations to TPP software
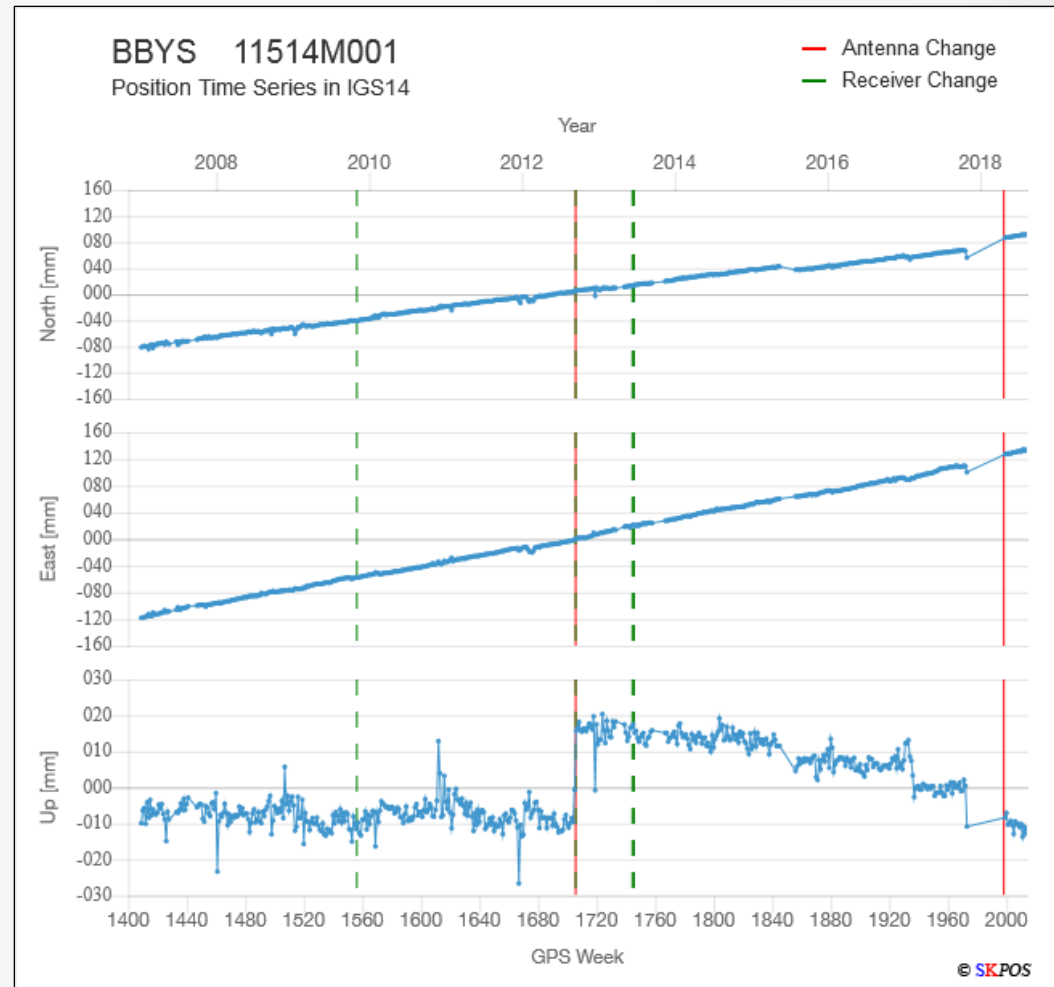- Visualization inspired by EPN solution

SKPOS quality control

- Client/Server application accessible via web browser
- App available only for SKPOS administrators
- Used programming languages
  - HTML
  - CSS
  - Javascript (Angular 5)
  - PHP
  - MySQL
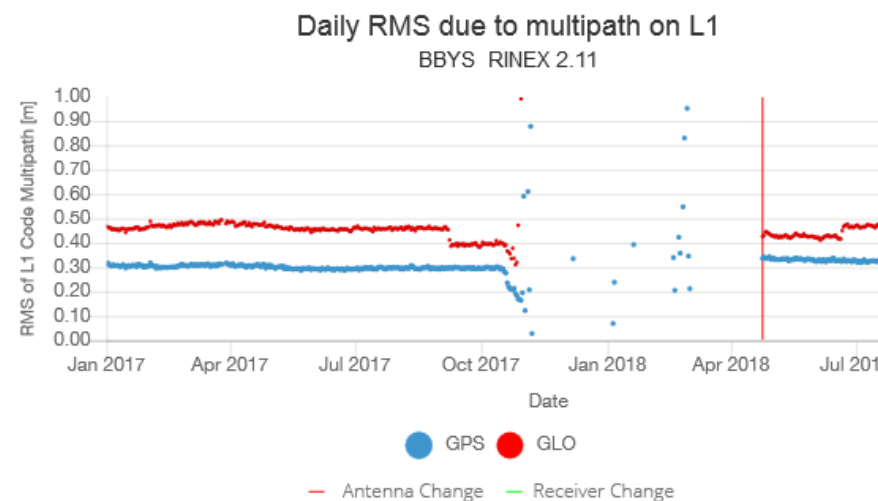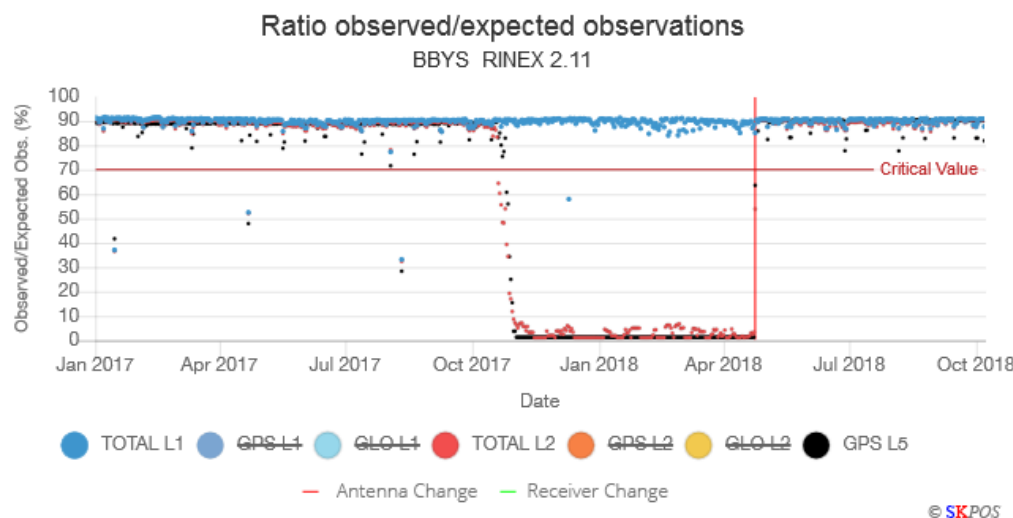 - Batch file

SKPOS quality control – Time Series

- Automated rendering position time series of permanent stations in IGS14 and ETRF2000
- Input: SINEX files processed by Bernese GNSS software
- Equipment changes visualisation
- Zoomable chart
- Export chart to image
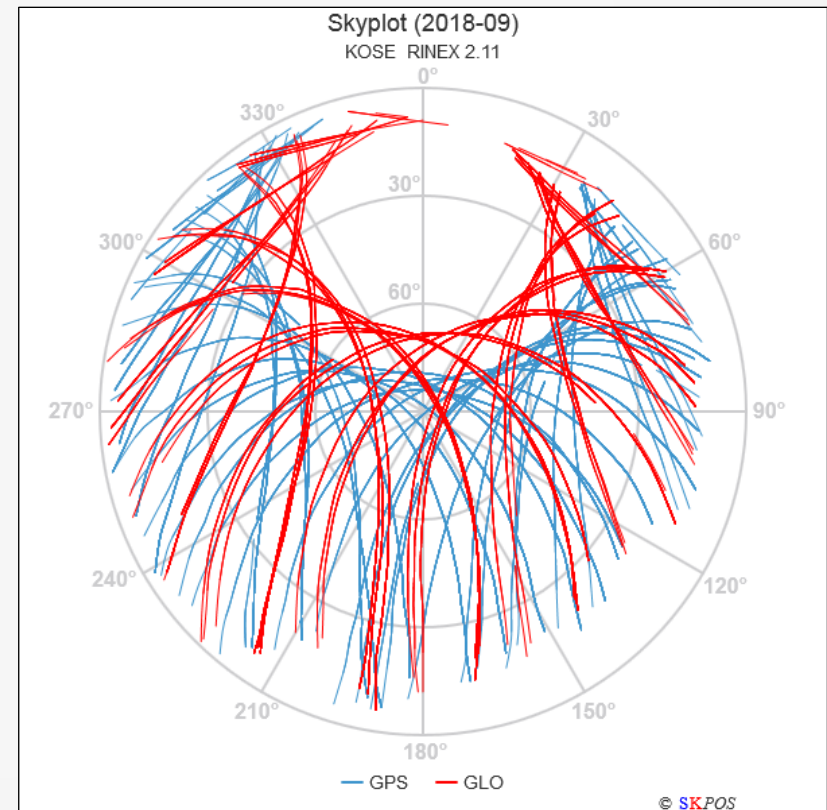
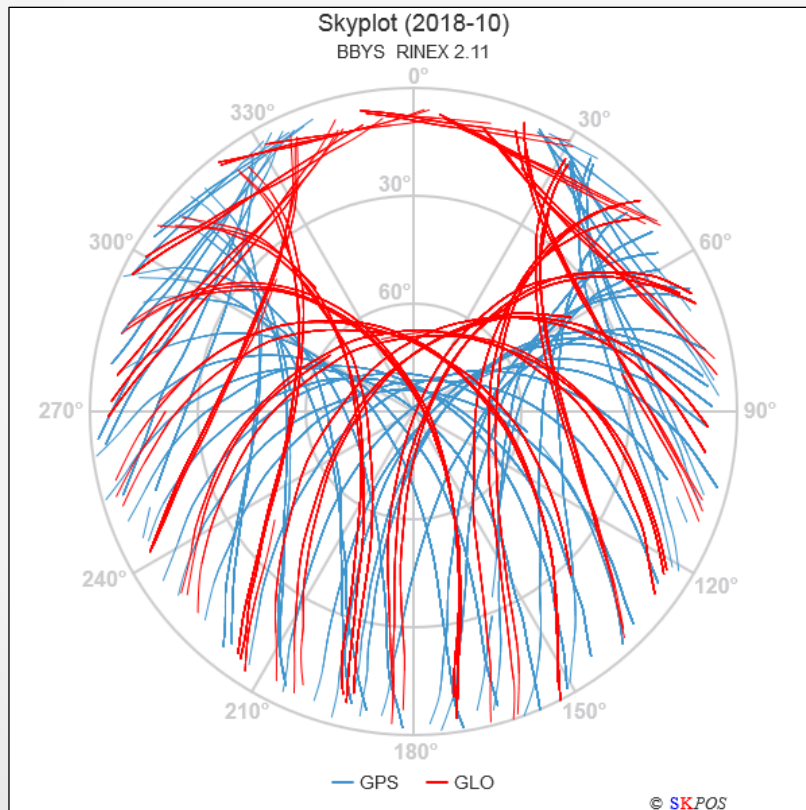# SKPOS quality control – Data Quality

- Daily RINEX 2.11 files processed by G-Nut/Anubis tool
- Output charts:
  - Ratio observed/expected observations
  - Number of observations
  - Number of cycle slips
  - Multipath on L1, L2, L5

Ratio observed/expected observations
BBYS RINEX 2.11

Daily RMS due to multipath on L1
BBYS RINEX 2.11

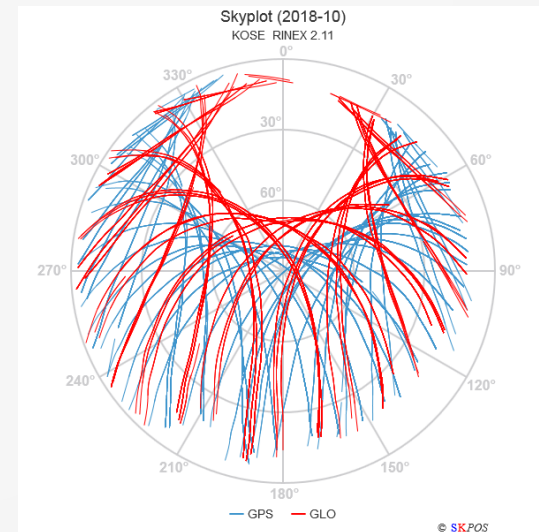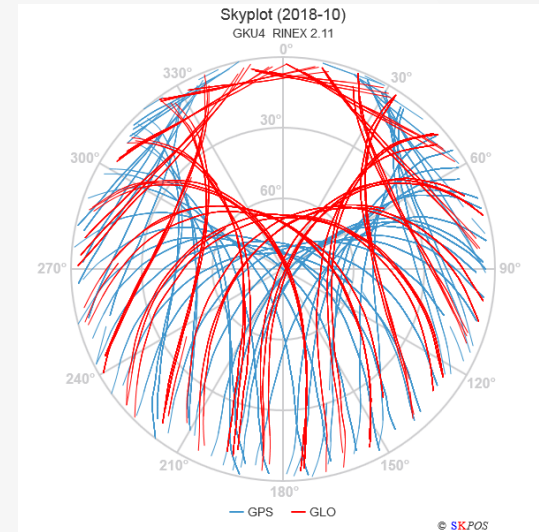# SKPOS quality control – Skyplot

- Daily RINEX 2.11 files processed by G-Nut/Anubis tool
- Output chart:
  - Monthly snapshots of satellite tracking

SKPOS quality control – Skyplot
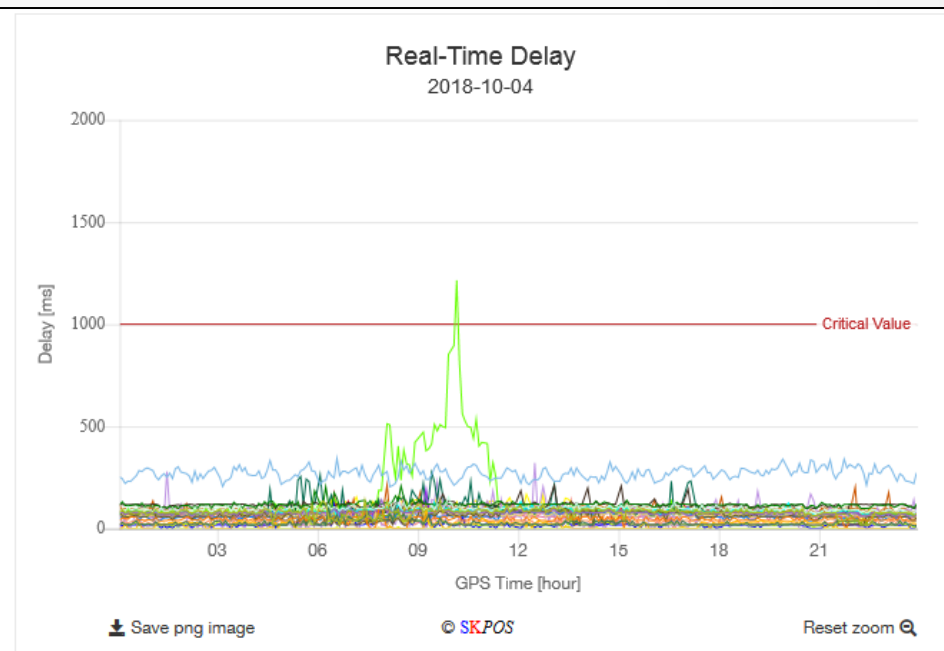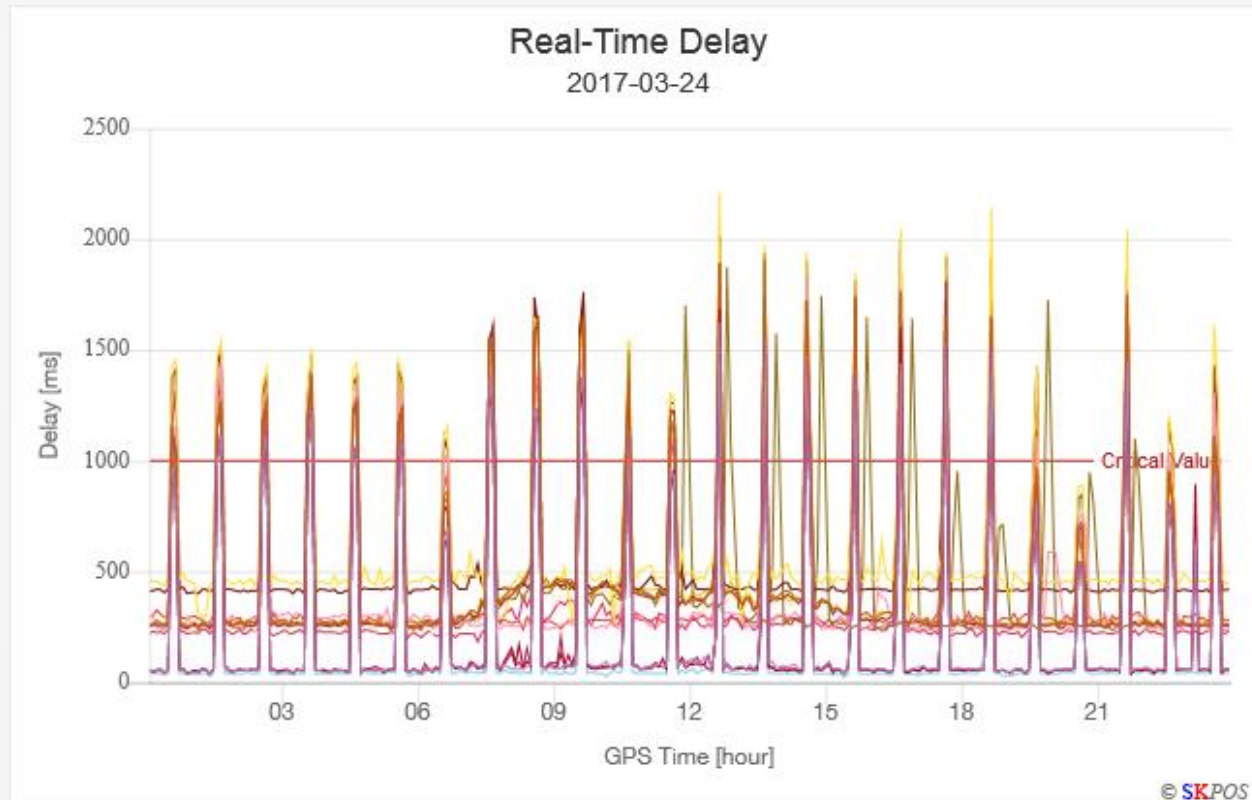## Pillar vs roof monumentation

SKPOS quality control – Data Availability

- Availability of daily 30s RINEX 2.11 data

	SKPOS stations															Foreign stations																		
	BASV	BBYS	BREZ	DOPL	GANP	GKU4	HUVO	JABO	KAME	KOLS	KOSE	KUZA	LIE1	MOP2	PEMB	PRES	RISA	SKDS	SKLM	SKLV	SKMT	SKNR	SKPB	SKRV	SKSE	SKSK	SKSL	SKSV	SKTN	SKVT	SKZV	TELG	TREB	VELS
Availability (%)	91.8	99.5	100	71.2	99.5	99.7	85.2	100	99.7	65.2	100	100	99.5	98.1	100	100	99.7	100	99.7	100	100	100	100	100	100	100	100	99.7	100	100	99.5	99.7	100	99.7
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2017-12-05																																		

SKPOS Quality Control – Real-Time Delay

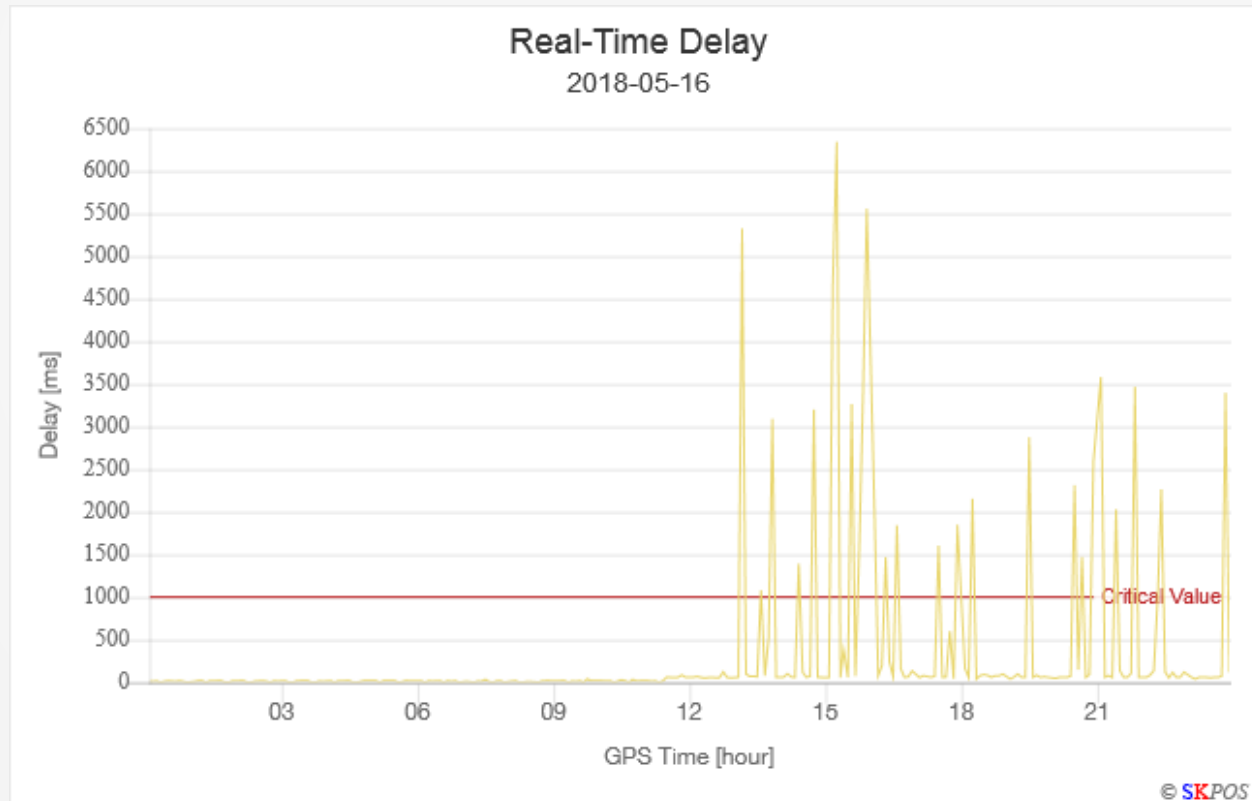- Delay of data from stations to Trimble Pivot Platform in real-time

SKPOS Quality Control – Real-Time Delay

- Detection of high latency on foreign station

SKPOS Quality Control – Real-Time Delay

- Detection of problem with internet connection

Thank you for your attention