



National report of SLOVAKIA

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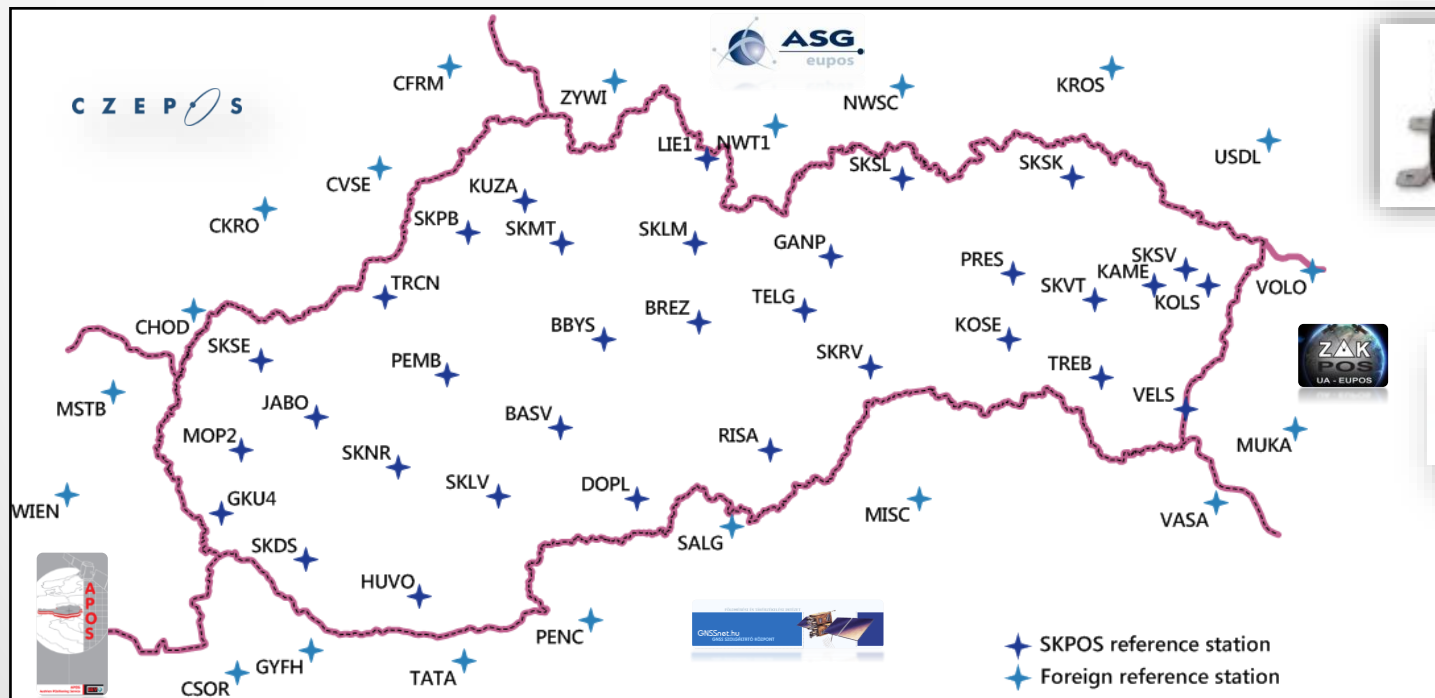


6th EUPOS[®] Council and Technical Meeting
October 30-31, 2019. Budapest, Hungary

SKPOS stations infrastructure

Status in October 2019

- **33 Slovakian permanent stations**
 - All stations with TRIMBLE receivers and antennas
 - All stations observe GPS + GLONASS + Galileo + BeiDou
- **20 foreign permanent stations (APOS, gnsnet.hu, CZEPOS, ASG-EUPOS, ZAKPOS)**



SKPOS stations infrastructure

April 2018

- 5 new Trimble Zephyr Geodetic 3 antennas



Zephyr Geodetic 2

Full support GAL, BDS



TRCN, SKSV, SKLV,
GKU4, KOLS



Zephyr Geodetic 3

SKPOS stations infrastructure

August 2018

- 4 new Trimble Alloy receivers



Trimble NetR8

Plná podpora GAL, BDS



TRCN, GANP, SKNR, VELS



Trimble Alloy

SKPOS stations infrastructure

March 2019

- New UPS battery backup

Backup of receivers, routers



AEG Protect



Rellio UPS VSD2200

SKPOS stations infrastructure

April 2019

- Station relocation

reinforced-concrete pillar instead of roof monumentation



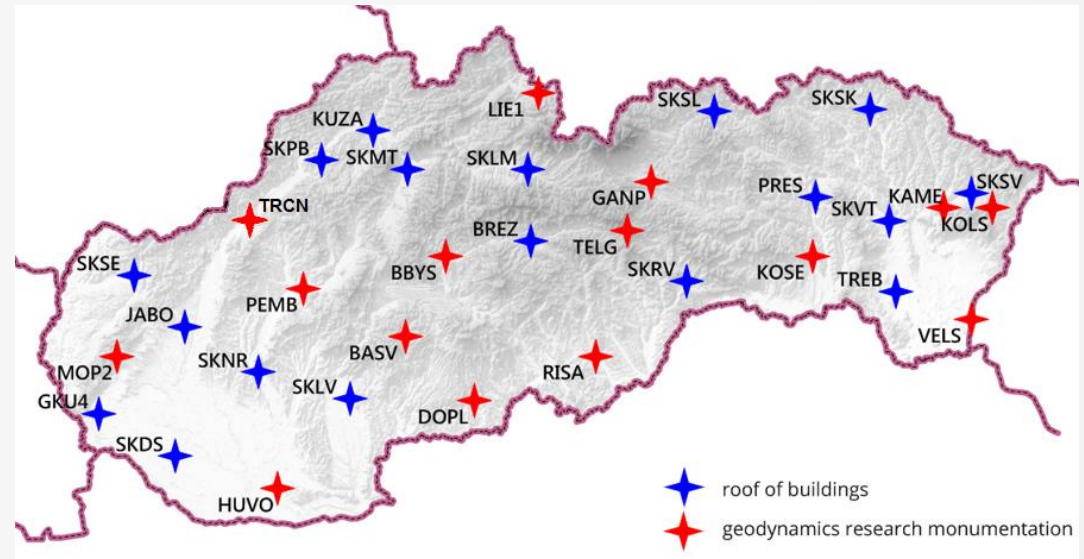
SKTN



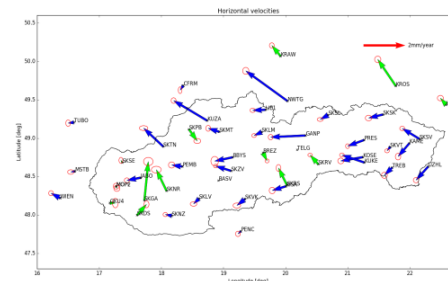
TRCN

SKPOS stations infrastructure

- 15 of 33 slovakian permanent stations (45%) have monumentation suitable for geokinematics



eliminated: jumps + outliers + period + weights



SKPOS infrastructure

August 2019

- GNSS/InSAR integrated station PEM2



SKPOS infrastructure

September 2019

■ Control software:

- Trimble Pivot Platform 4.3
- RTXNet procesor

September 2019

Galileo

BeiDou






■ Receivers firmware

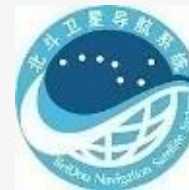
- Trimble receivers: version 5.42



SKPOS – Galileo and BeiDou

Full capability Galileo and BeiDou

SKPOS	Component	GPS + GLONASS + Galileo + BeiDou
Hardware	Antennas	 33 (33)
	Receivers	 33 (33)
Software Trimble Pivot	RINEX CORS, VRS	
	RTK VRS  2018-10-16	



SKPOS portfolio

Data formats – content - charges

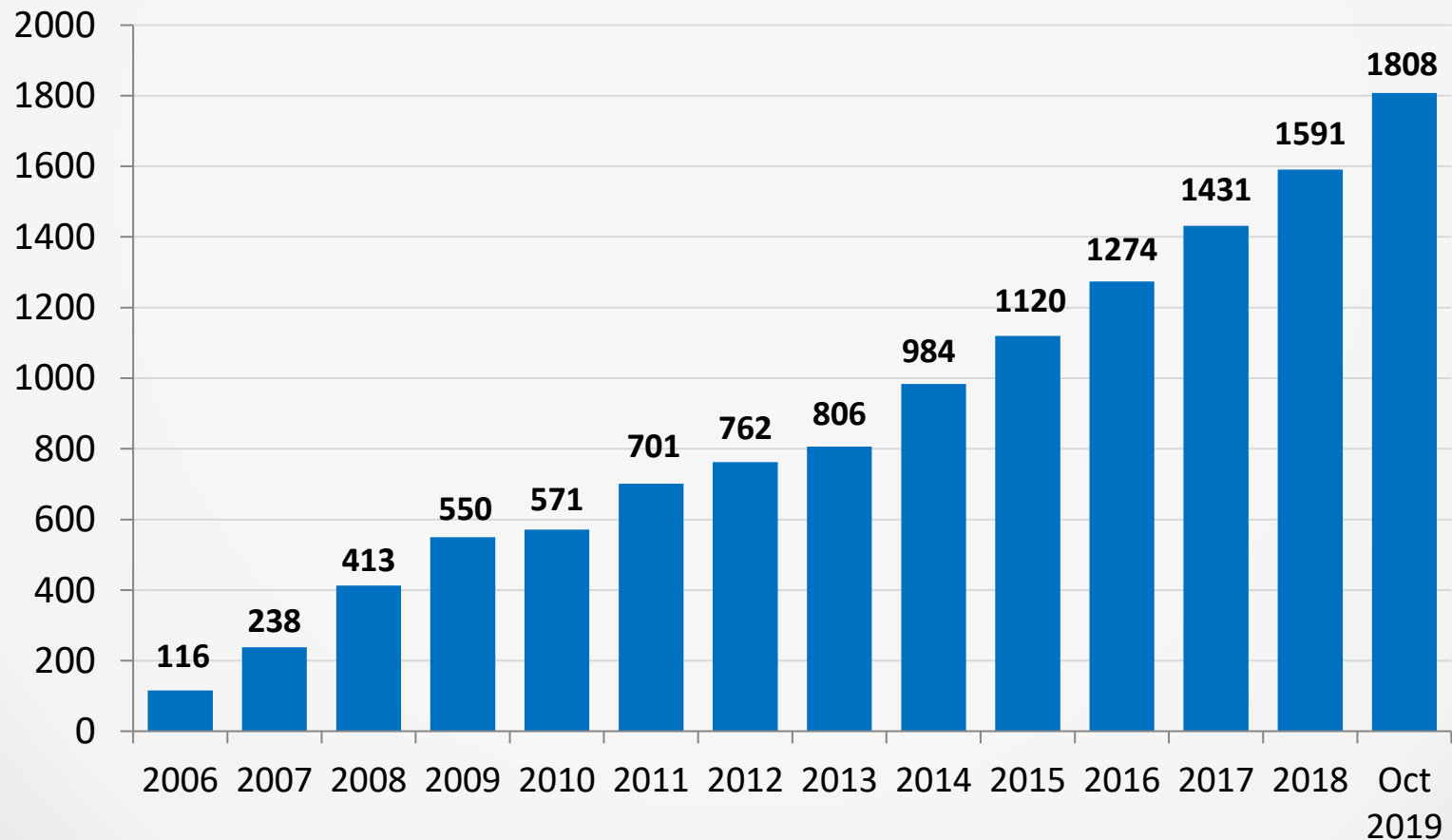
Only network solution (Network RTK in VRS concept) is provided.
No single RTK!

Package	Content	Duration	Format	Flat rate
SKPOS_mm	RINEX 1000 h	year	RINEX 2.x, 3.x	50 €
SKPOS_cm (year)	RTK unlimited + 50 h RINEX	year	RTCM 2.3, 3.1, RTCM 3.2 MSM, CMRx, CMR+	50 €
SKPOS_cm (month)	RTK unlimited	month	RTCM 2.3, 3.1 RTCM 3.2 MSM, CMRx, CMR+	19 €
SKPOS_dm	DGNSS unlimited	year	RTCM 2.1, 2.3	20 €

SKPOS

number of users

- over 1,800 registrations (Oct. 2019)

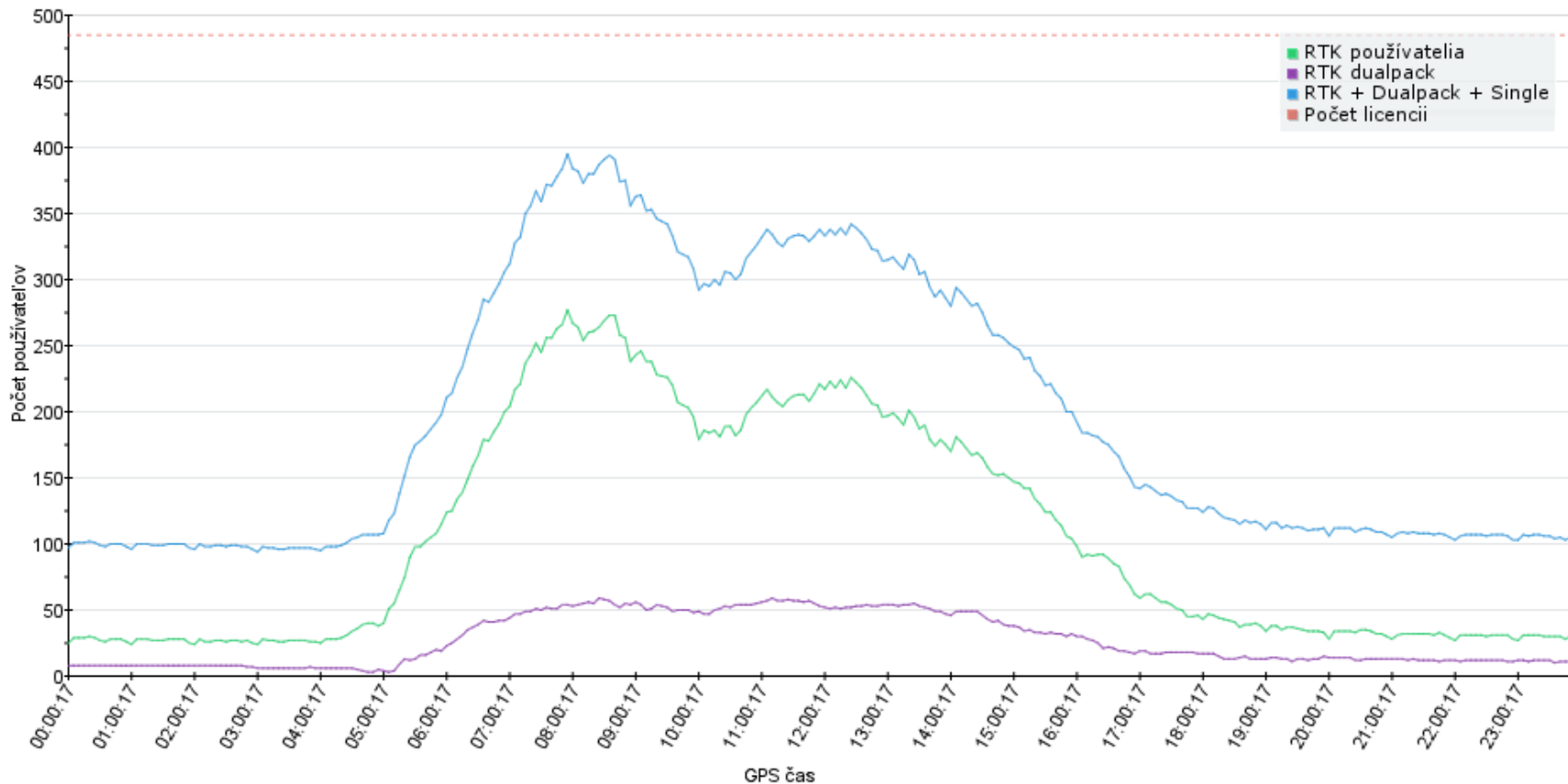


SKPOS

simultaneous logins

- Maximum: 395 simultaneous logins (2019-10-15)

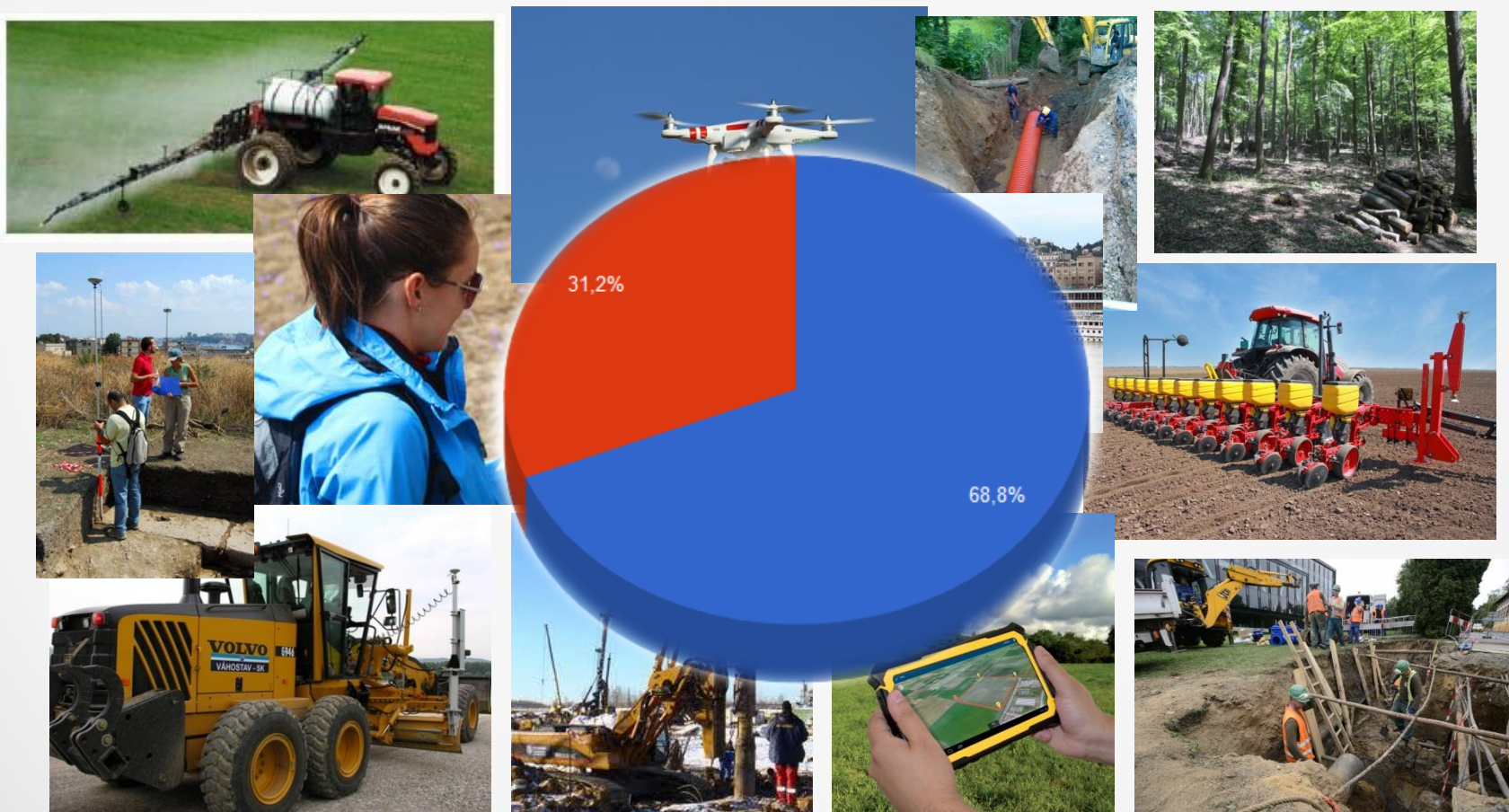
15.10.2019 - Počet pripojených používateľov



SKPOS

Type of users (precise values from registration forms)

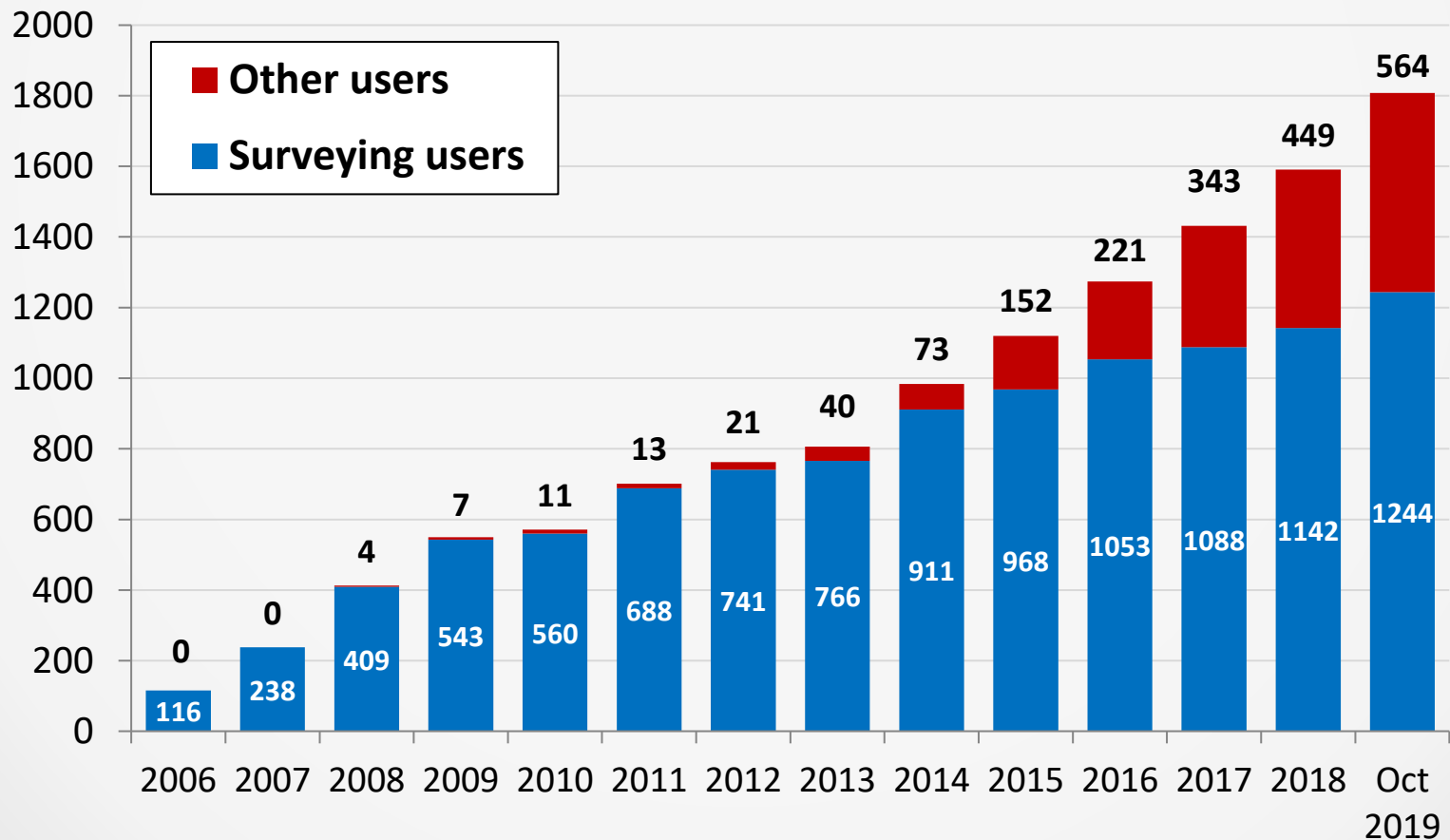
- Surveying fields (cadastre, surveying, mapping, GIS) – **69 %**
- Other fields (precise agriculture, machine guarding) – **31 %**



SKPOS

Type of users (precise values from registration forms)

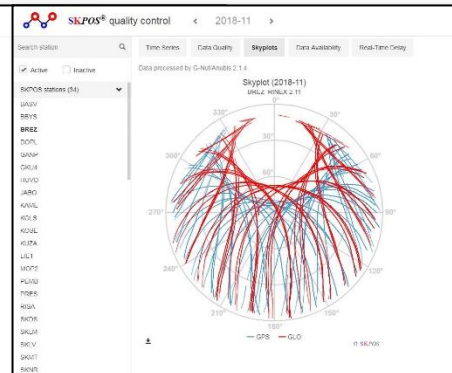
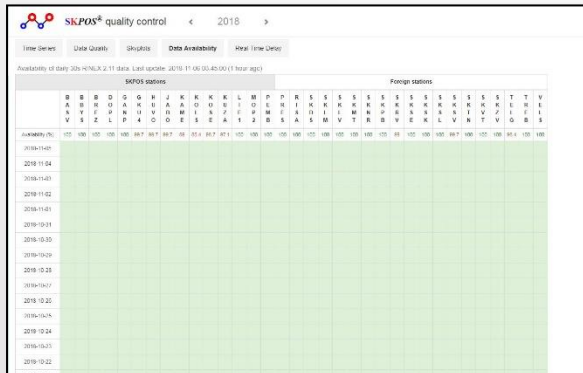
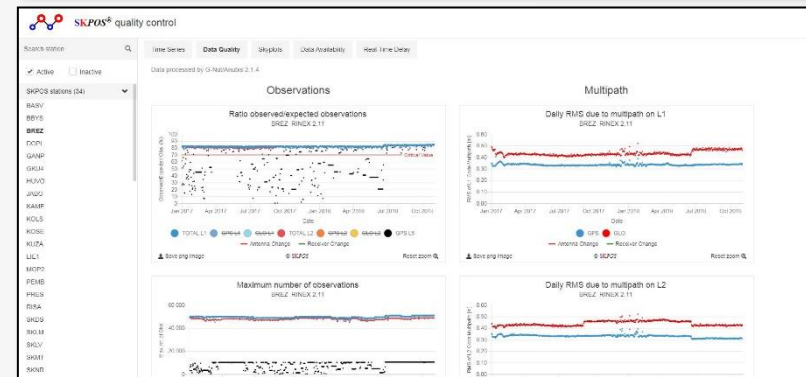
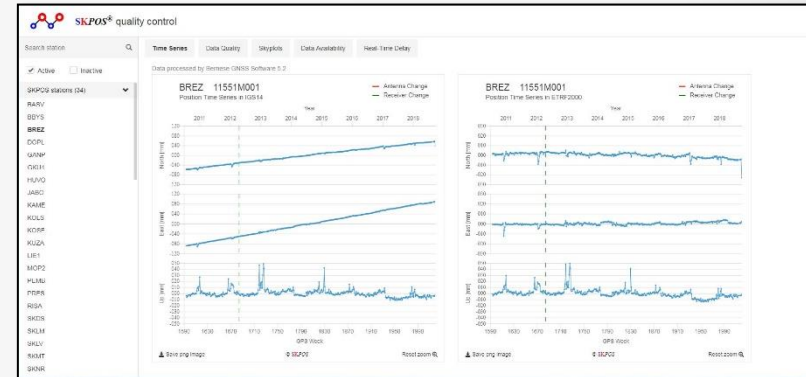
- Since 2017 more new SKPOS users were from non geodetic field



SKPOS Quality Control

Quality Control RINEX v3 (under development)

- Time Series
- Data Quality:
 - Number and percentage of observations
 - Ambiguity resolution
 - SNR
 - Cycle slips
 - Multipath errors
 - Skyplots
- RINEX availability
- Real-time data delay (station -> control sw)
- 86 stations (SKPOS / foreign SKPOS / EPN)



EPSG Registry

Standardization for Slovakian reference systems

- The **EPSG** Geodetic Parameter Dataset is a structured dataset of Coordinate Reference Systems and Coordinate Transformations
- All valid slovakian geodetic reference system are standardized = have EPSG codes from february 2018



Reference system	EPSG Code
S-JTSK (JTSK) East-North	EPSG:5514
S-JTSK (JTSK) South-West	EPSG:5513
S-JTSK (JTSK03) East-North	EPSG:8353
S-JTSK (JTSK03) South-West	EPSG:8352
...	

Thank you for your attention

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