Latvian Geospatial
Information Agency

Latvian Geospatial Information agency national report

NKG Working Group for GNSS positioning

National Land Survey of Finland

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Geodetic measurements division
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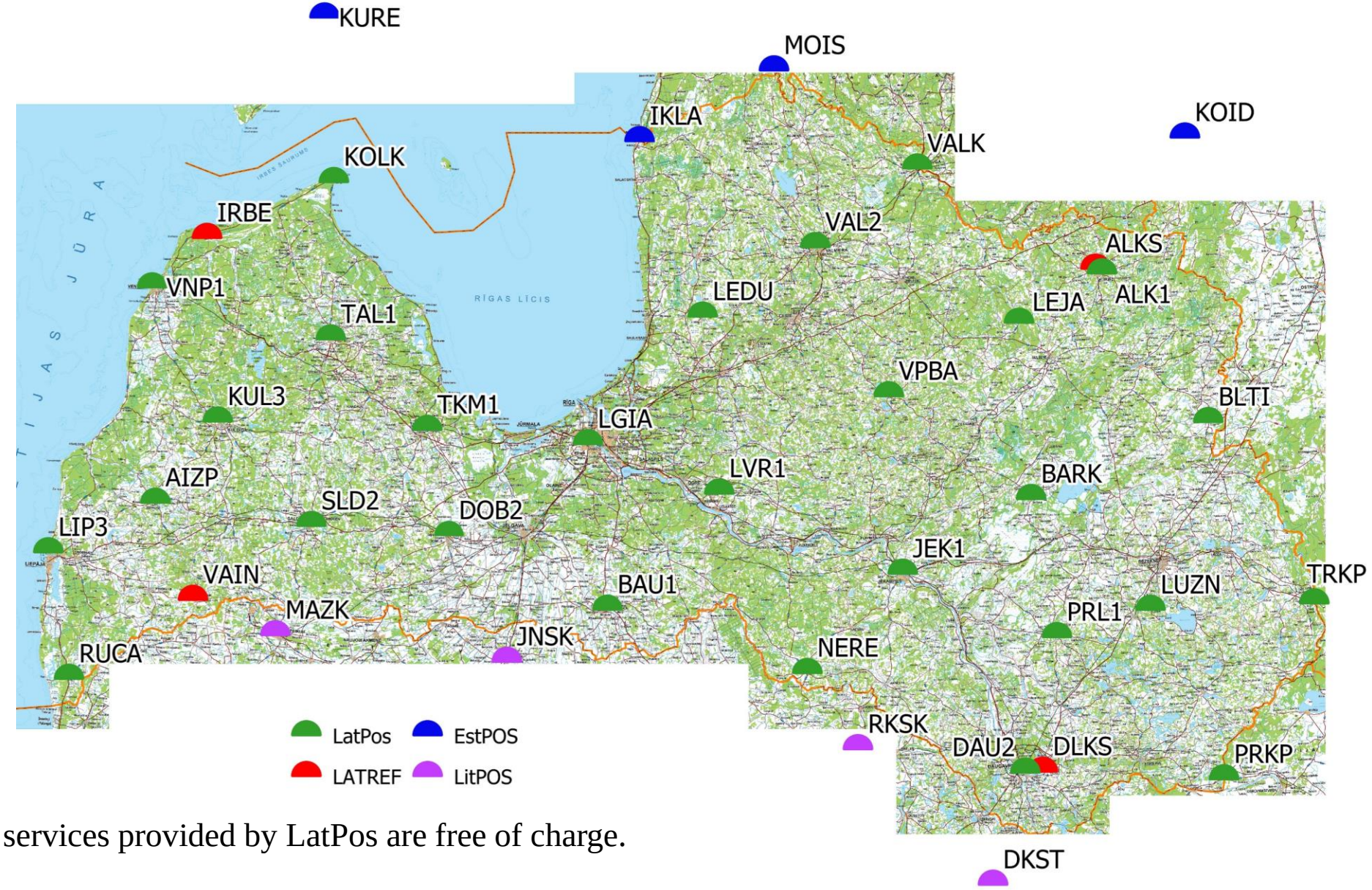
Technical characteristics of LatPos, till 25.02.2025

Operating base stations:
- LatPos 28
+
- EstPOS 5
+
- LitPOS 4

Received GNSS systems:
- GPS NAVSTAR
- GLONASS
- Galileo
- BeiDOU

Software: GNSS Spider



Since July 1, 2018, all services provided by LatPos are free of charge.

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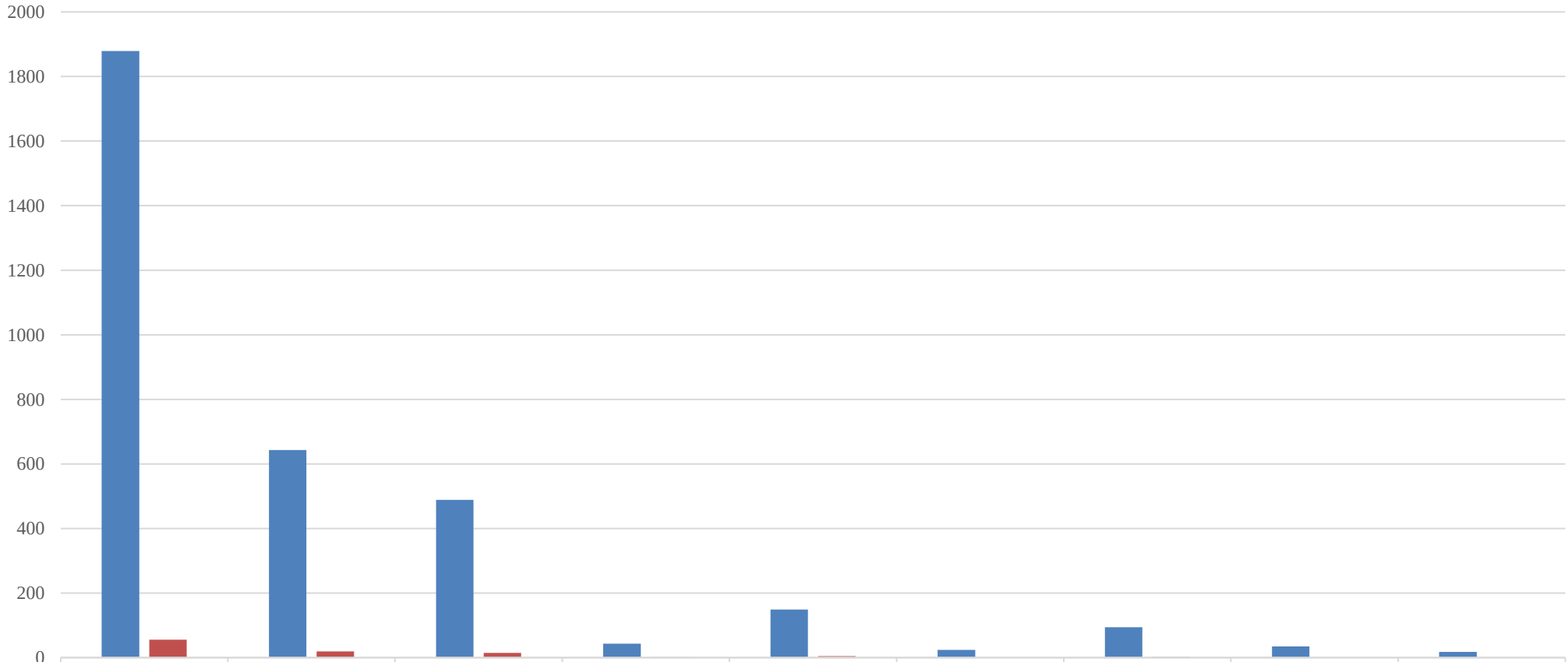
Distribution of LatPos users by group, till 25.02.2025



	Agriculture	Surveying	Construction	University	Other	LGIA	Government	Design	Municipality
Count	1879	643	489	43	149	24	94	35	18
Percentages	55,69	19,06	14,49	1,27	4,42	0,71	2,79	1,04	0,53

Users themselves choose which field of activity is most suitable for them, based on the LatPos terms of use

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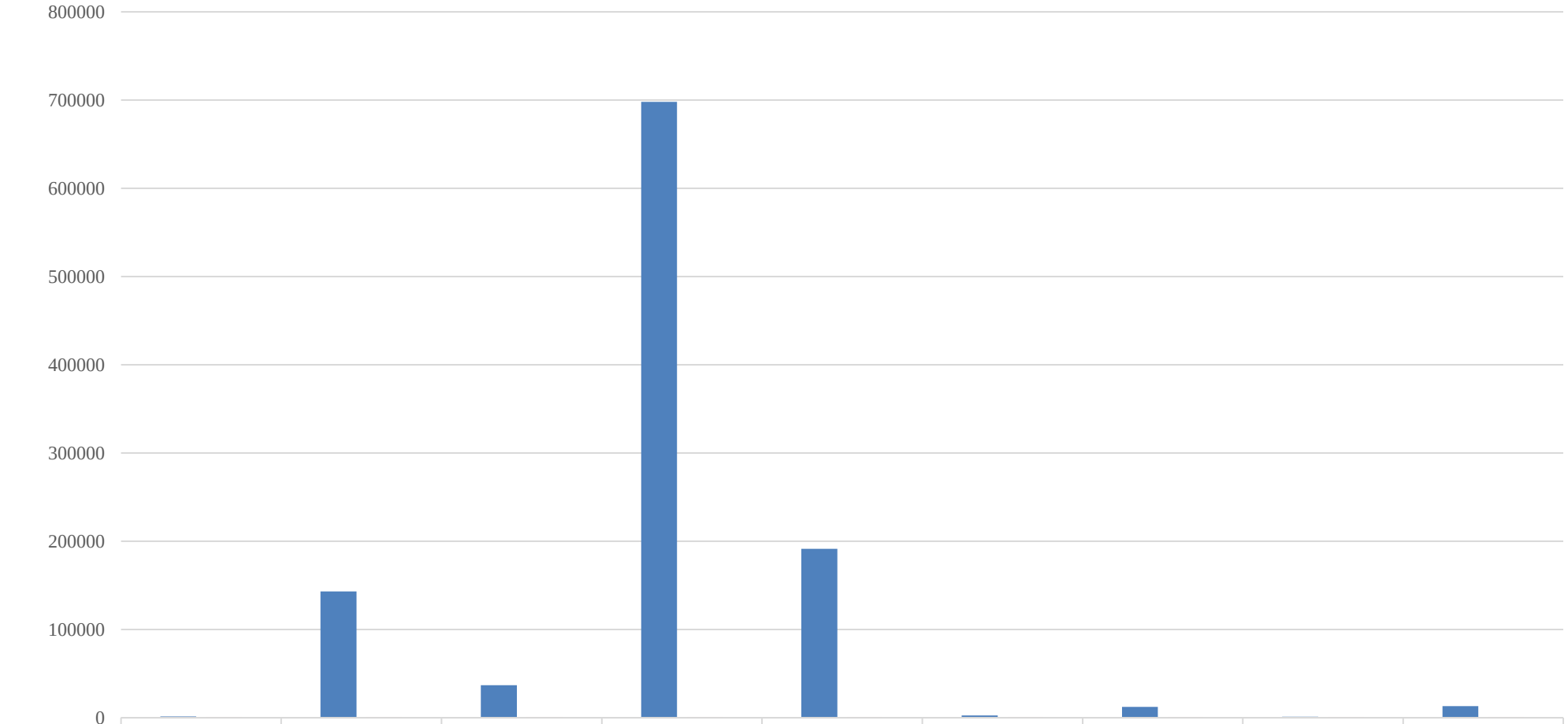
Number of RTK connections by group, 2024



	LGIA	Construction	Other	Agriculture	Surveying	Municipality	Design	University	Government
Count	1518	143264	36968	697952	191460	2680	12254	1154	13202
Percentages	0,14	13,02	3,36	63,42	17,40	0,24	1,11	0,10	1,20

Total of 1 100 452 connections to the LatPos network were registered

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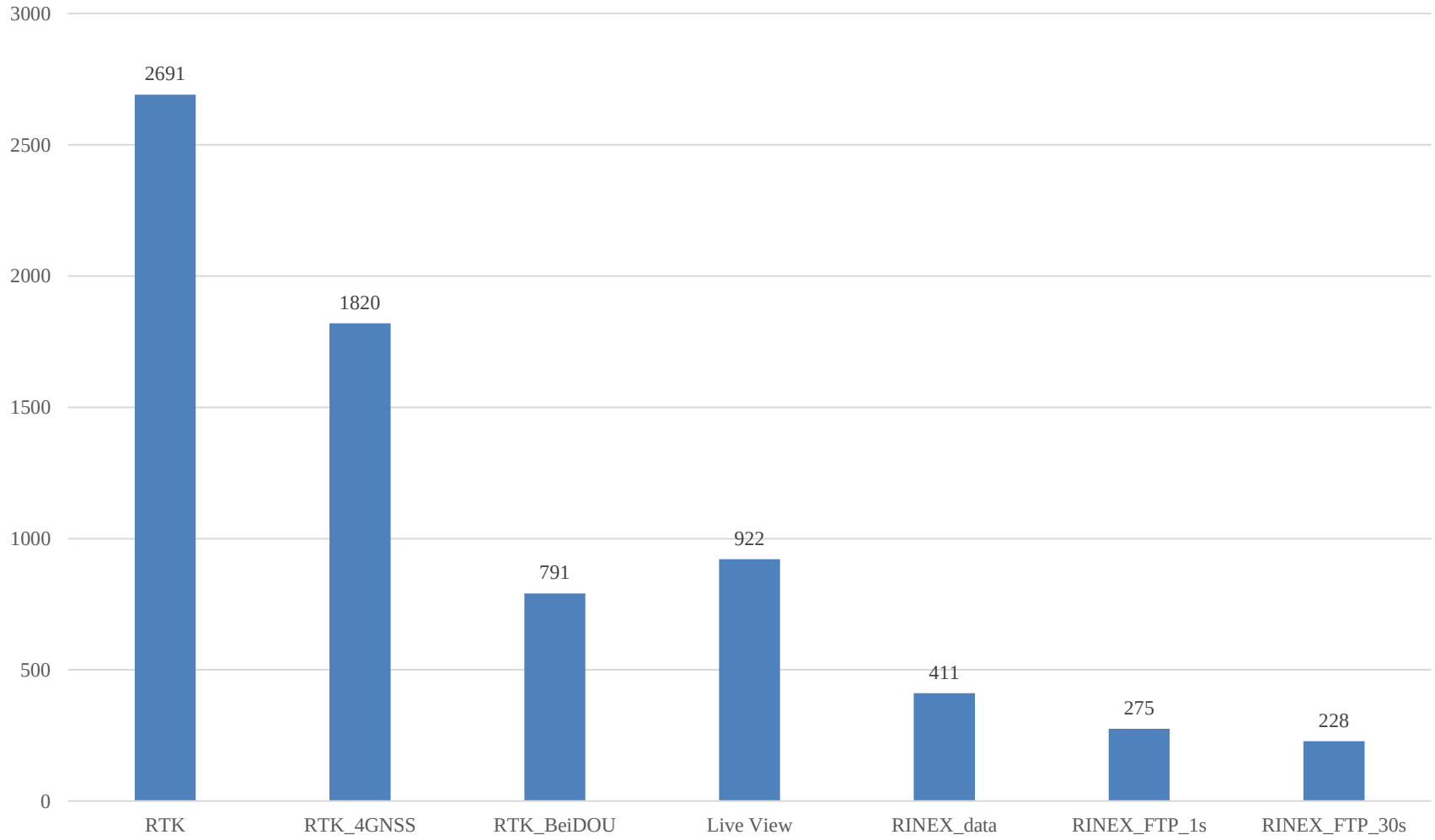
Number of applied services, till 25.02.2025



According to available data, RTK service is mostly used by farmers

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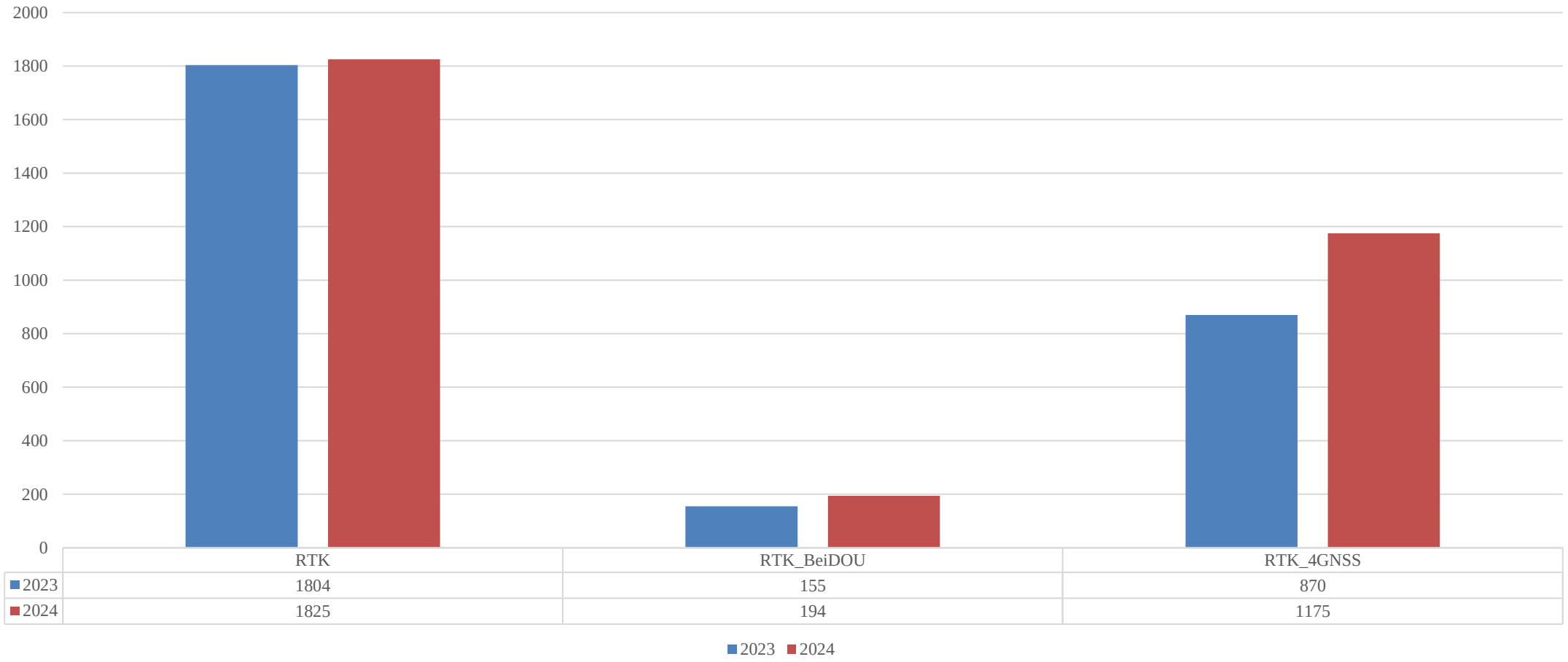
Distribution of users of real-time services



Current number of RTK service users. The number may differ from the number of services applied for (Slide No. 5), as one user can apply for and use all services.

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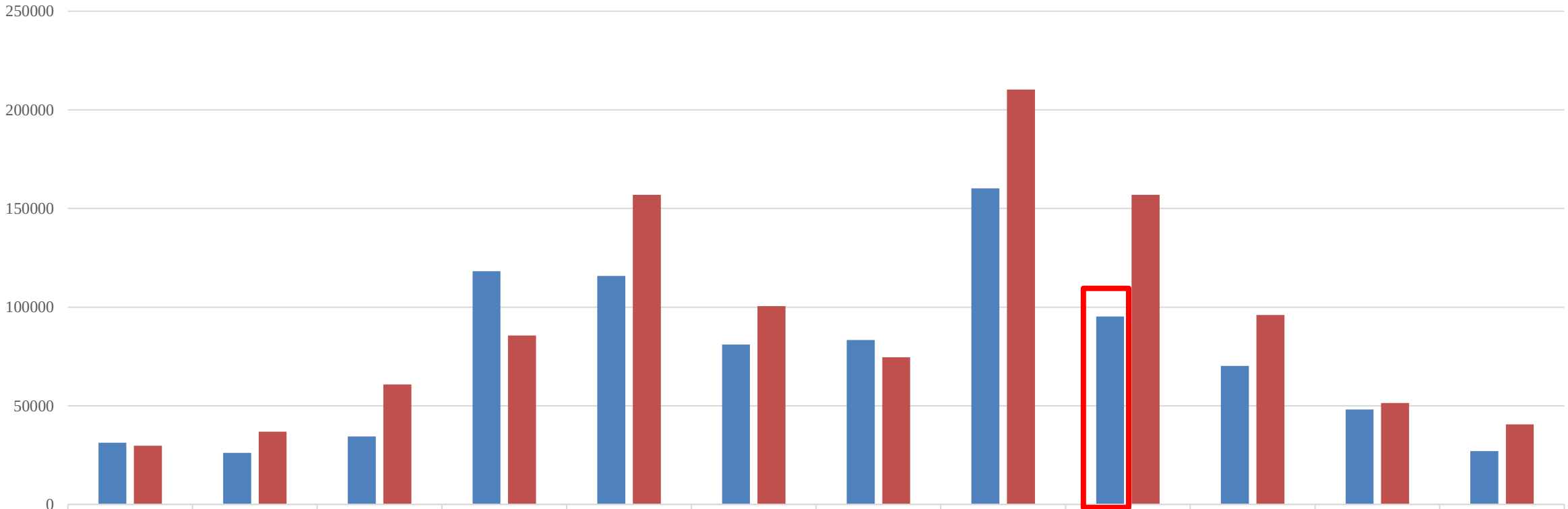
Activity of LatPos users (RTK) connections



	January	February	March	April	May	June	July	August	September	October	November	December
2023	31295	26176	34444	118259	115868	80986	83366	160259	95274	70251	48092	27005
2024	29759	36834	60824	85626	156982	100464	74617	210338	156954	96066	51389	40599

The data for September 2023 is incomplete, so the number of connections is not exact

In 2023, a total of 891 275 connections to the LatPos network were registered.
In 2024, a total of 1 100 452 connections to the LatPos network were registered.

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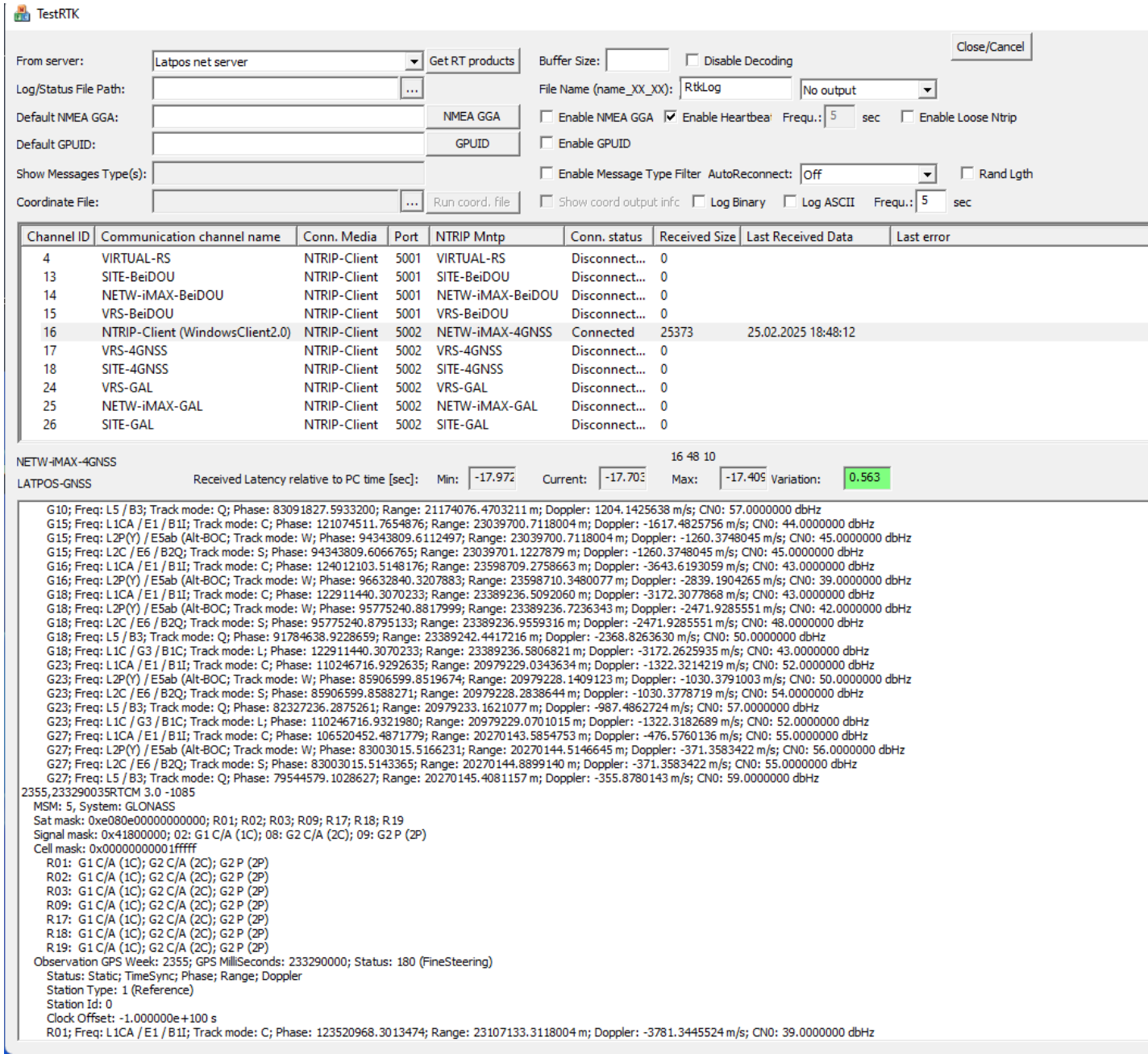
RTK monitoring (1)

TestRTK is additional tool for GNSS Spider

- NMEA are indicated from GNSS Spider.
- Connection to the LatPos network is simulated.
- We see:
  - Received RTCM messages.
  - Frequencies
  - Which GNSS satellites are being received
  - Carrier to noise



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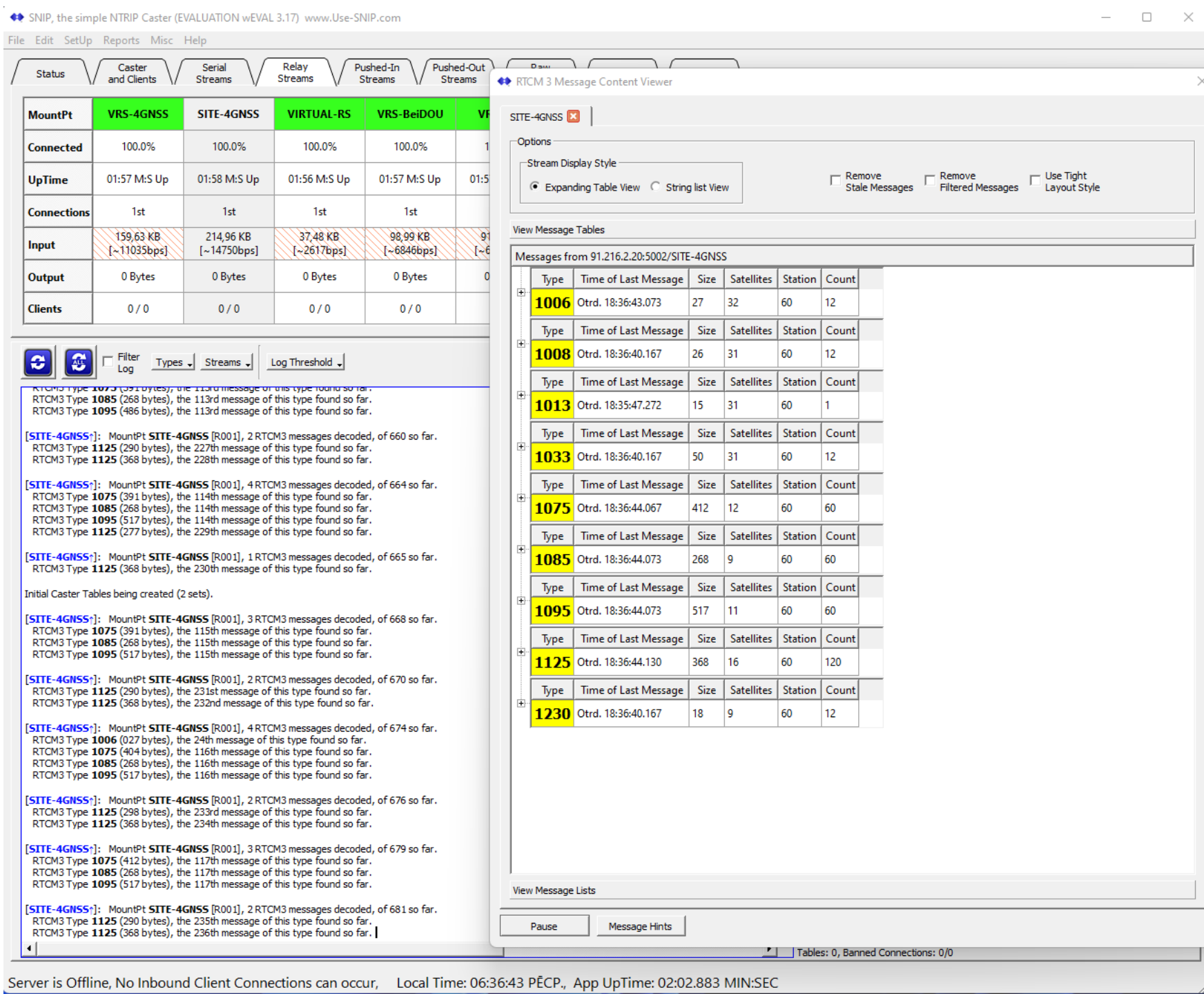
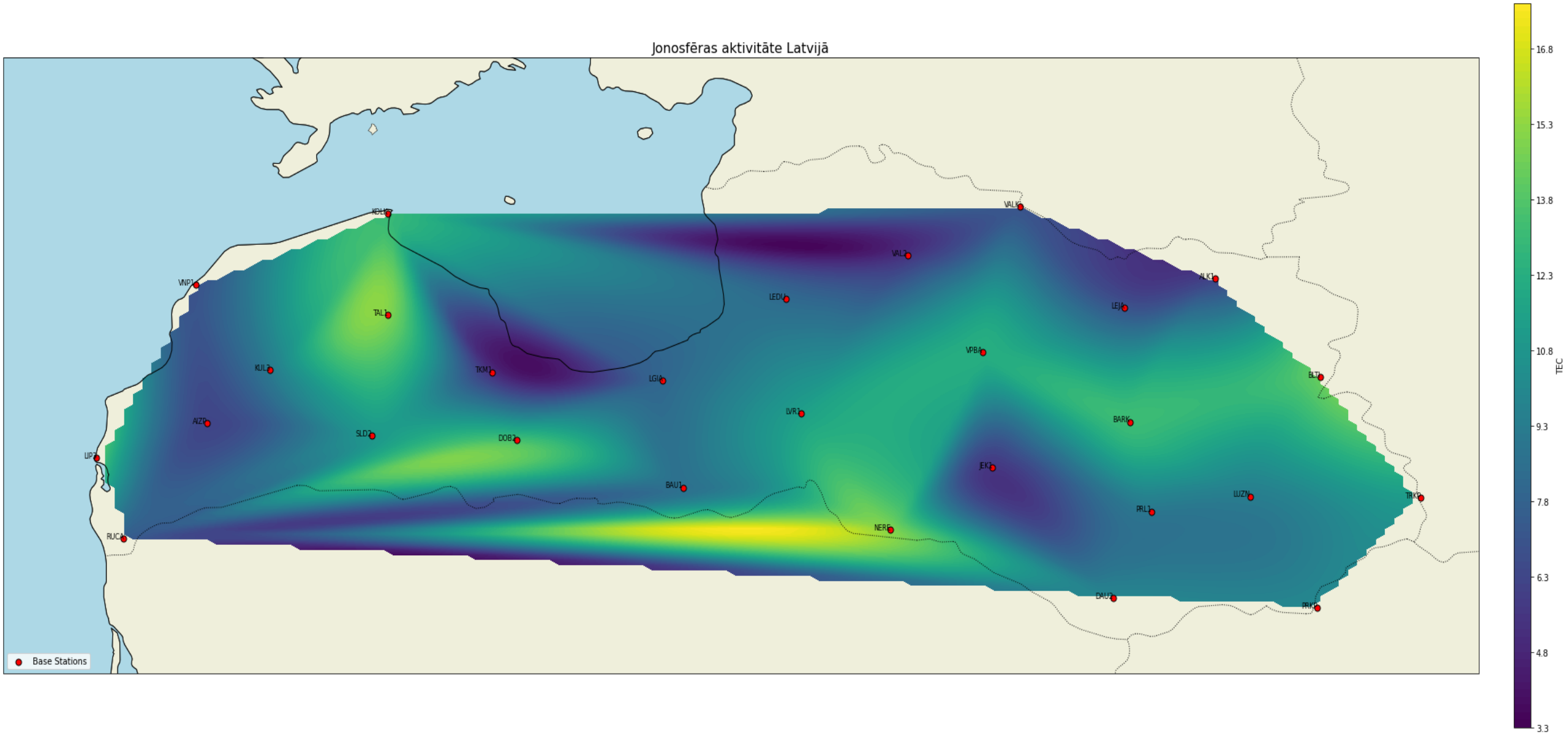
Paid license.
Currently we are using evaluation period licenses.

Recommendations on what to pay more attention to during RTCM monitoring?



Monitoring of ionospheric activity



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RINEX file quality control

- Gnut/Anubis Real Time software will be used to monitor RINEX data quality.

Interference detection

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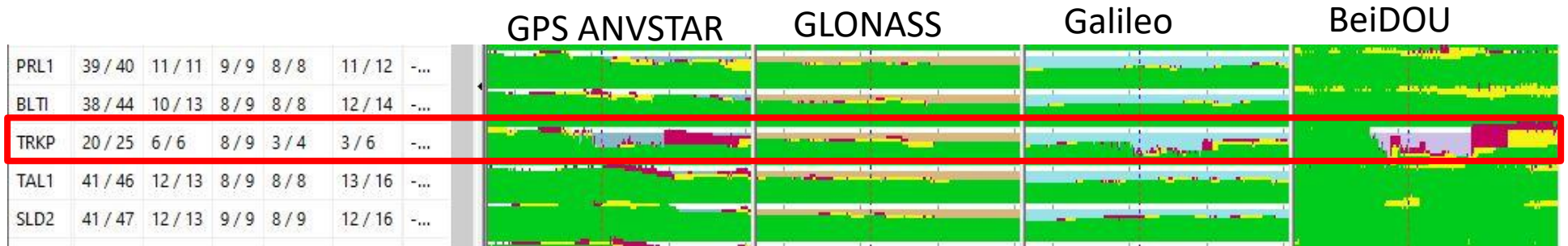
All LatPos base station receivers use Interference Detection Tool built into LEICA GR30 receivers, potential GNSS signal interference is stored.

date_time	system	signal	bandwidth	power	density	MHz
2024-02-09 09:13:59	GPS	L1 C/A	1,17	-73,31	-128,74	1575,78
2024-02-09 10:04:41	Galileo	E6	0,59	-65,36	-118,33	1278,23
2024-02-09 10:26:41	Galileo	E6	1,03	-59,77	-111,39	1278,38
2024-02-09 11:34:12	Galileo	E6	0,73	-54,82	-105,04	1280,8
2024-02-09 11:57:55	GPS	L1 C/A	41,24	-56,73	-129,15	1588,71
2024-02-09 12:48:06	GPS	L1 C/A	14,94	-54,28	-122,02	1576,15
2024-02-09 13:13:46	Galileo	E6	0,37	-71,55	-122,97	1282,08
2024-02-09 13:48:34	GPS	L1 C/A	1,54	-73,66	-133,45	1575,16
2024-02-09 13:53:48	Galileo	E6	0,29	-72,53	-122,74	1277,87
2024-02-09 14:48:34	GPS	L1 C/A	58,67	-46,32	-117,5	1588,2
2024-02-09 14:56:27	Galileo	E6	0,44	-71,43	-125,36	1282,63
2024-02-09 15:48:34	GLONASS	L1 C/A	1,25	-72,46	-131,75	1602,11
2024-02-09 16:41:49	Galileo	E6	0,59	-64,69	-118,46	1282,11
2024-02-09 16:48:34	GLONASS	L1 C/A	6,81	-64,45	-128,56	1601,16
2024-02-09 17:00:19	Galileo	E6	0,29	-71,53	-122,14	1280,5
2024-02-09 17:48:34	GPS	L1 C/A	4,1	-69,26	-133,19	1574,54

Interference with GPS NAVSTAR, Galileo and BeiDOU GNSS signals on 09.02.2024 in the period from 11:20 to 11:40



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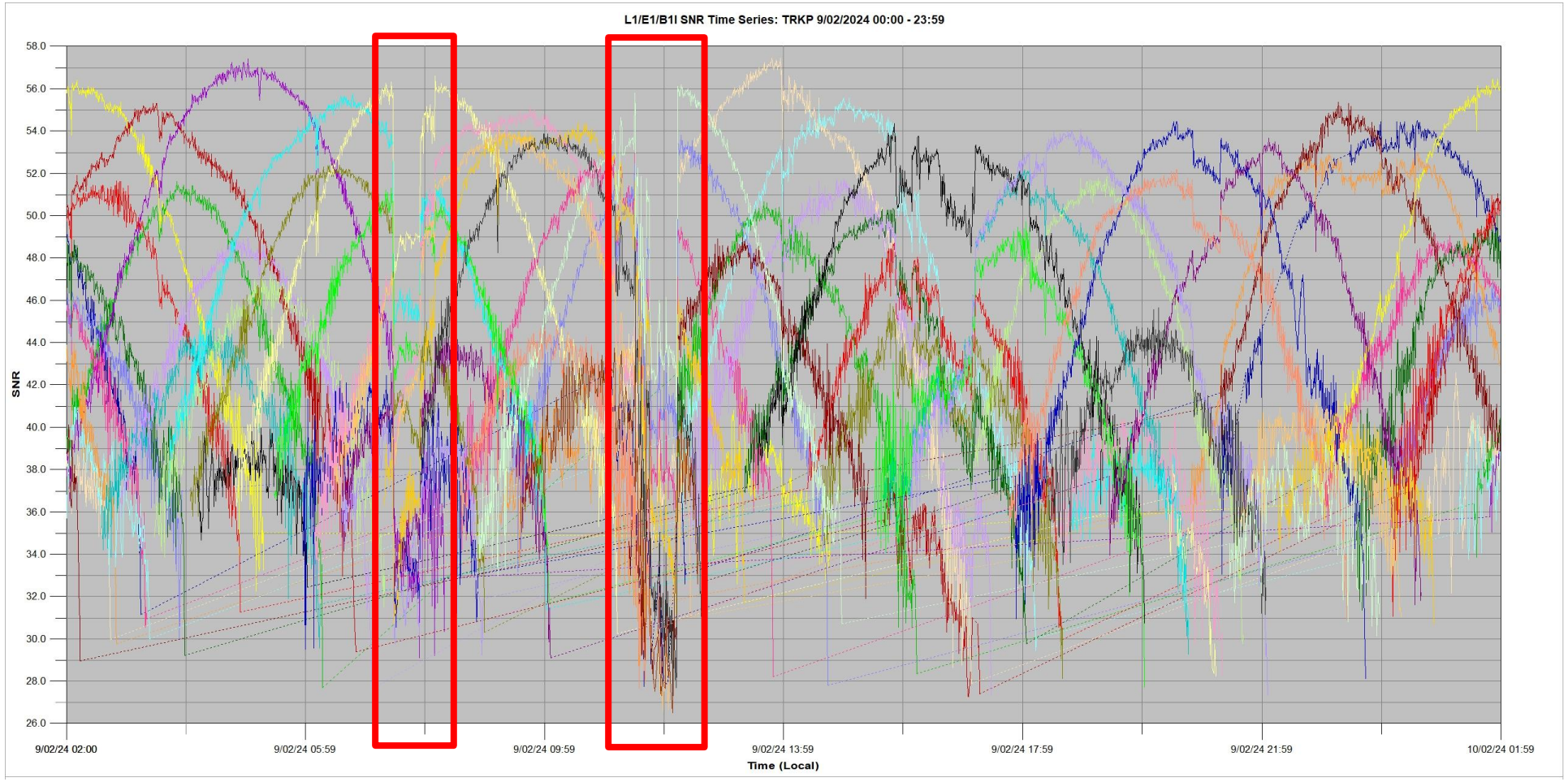
Interference detection (2)

A similar picture is in the L2/B1C and L5/E5a/B2a SNR times series



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Future plans (1)

- Fully learn G-Nut/Anubis Real Time software for data analysis
- Improving ionospheric monitoring
- Ensure continuous operation of base stations, data stream and provide RTK correction without interruption
- Improvement of RTCM monitoring
- New base station in Ainaži, Staicele or Salacgrīva (we'll see which will be the most suitable place for installation)
- It is also planned to include two EstPOS base stations in the LatPos network - RUH1 and SOVE which will replace KURE
- New more powerful server in the near future

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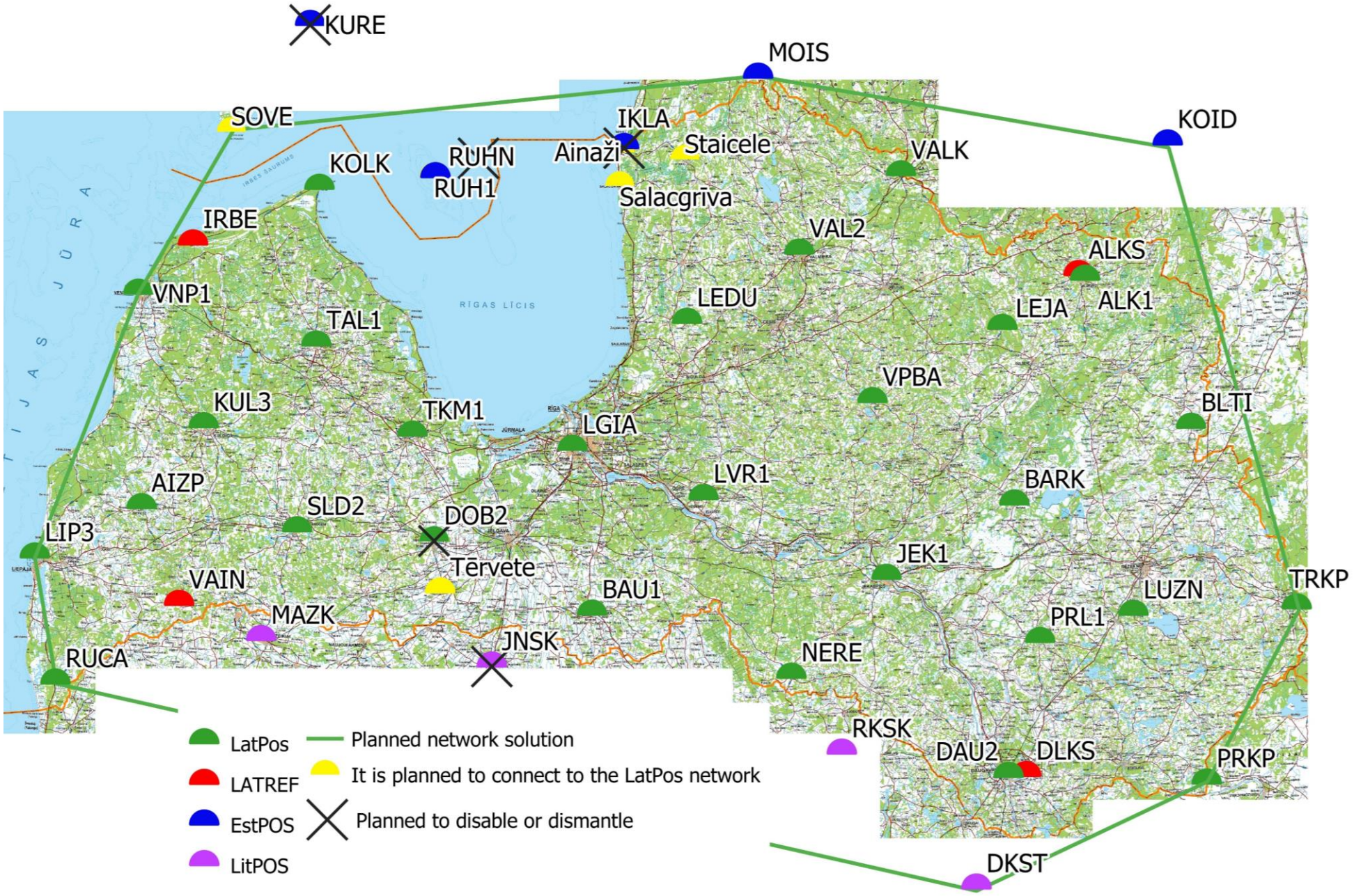
Future plans (2)



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Thank you for your attention!

Paldies par uzmanību!