MSM messages

Test measurements in Hungary

Warsaw, Poland
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Institute of Geodesy, Cartography and Remote Sensing – GNSS Service Centre

MSM message types

- **New standard to support new satellite systems**

- **Released in 2013**

- **DGPS/DGNSS, RTK, VRS streams can be formed (later FKP, MAC?)**

- **Not expected to be part of every day practice until Galileo is not in"operational" status**

MSM message types

	Messages	Content
MSM1	1071, 1081, 1091	Compact GNSS PseudoRanges
MSM2	1072, 1082, 1092	Compact GNSS PhaseRanges
MSM3	1073, 1083, 1093	Compact GNSS Pseudo- **and** PhaseRanges
MSM4	1074, 1084, 1094	Full GNSS Pseudo- and PhaseRanges **plus CNR**
MSM5	1075, 1085, 1095	Full GNSS Pseudo- and PhaseRanges plus CNR **and Doppler values**

Used data

- **Data from the Hungarian Active GNSS network**

- **DGNSS corrections of the nearest station**
- **Single base RTK corrections**

- **Both stream containing GPS + GLO data**

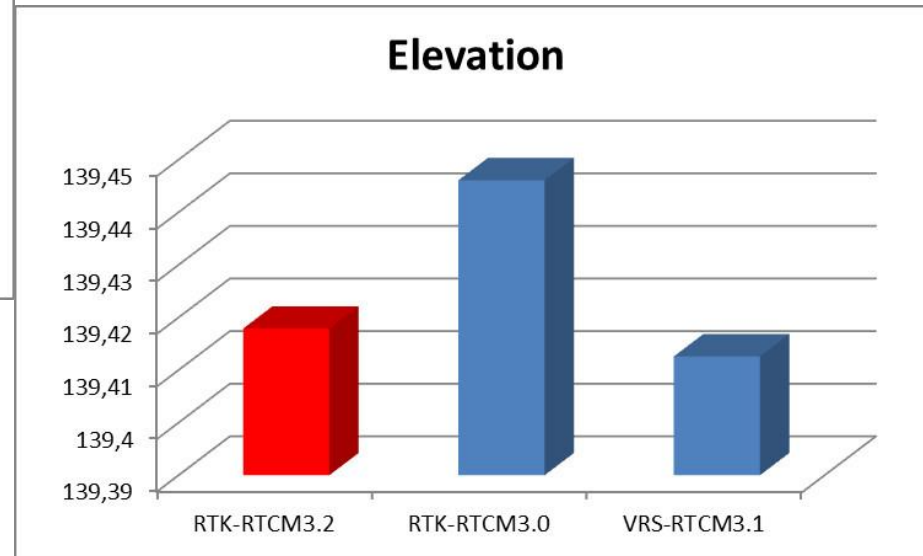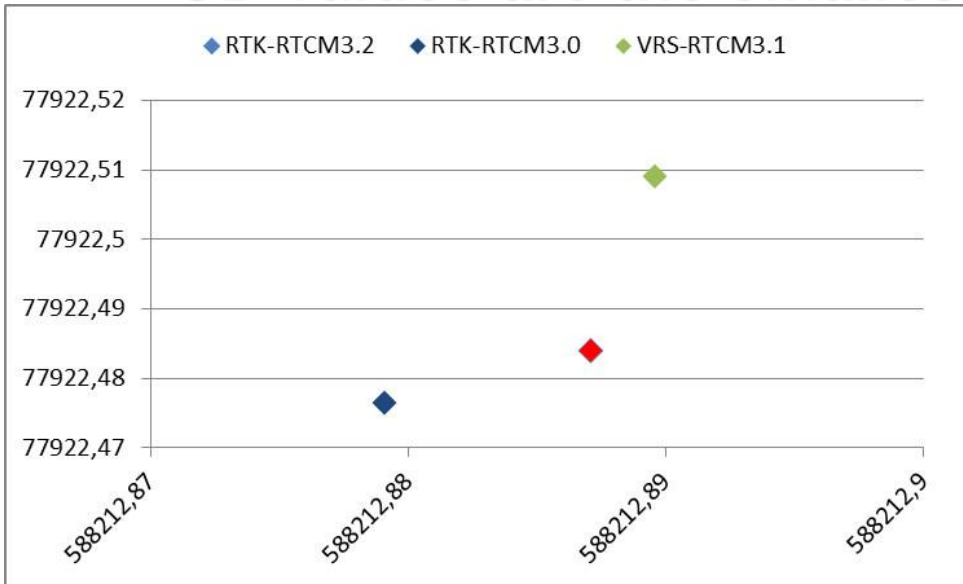|															
2101	SZEG_RAW-RTCM3.0	SZEG_RAW_RTCM3.0	RTCM 3.0	1004(1), 1006(60), 1008(60), 1012(1)	L1 L2	GPS+GLONASS	RAW	HUN	46.26°N 20.15°E	N	Single base	GNSMART	none	Y(B) N	1000
2101	TATA_RAW-RTCM3.0	TATA_RAW_RTCM3.0	RTCM 3.0	1004(1), 1006(60), 1008(60), 1012(1)	L1 L2	GPS+GLONASS	RAW	HUN	47.65°N 18.33°E	N	Single base	GNSMART	none	Y(B) N	1000
2101	TEST_DGNSS-RTCM3.2	DGNSS_RTCM3.2	RTCM 3.2	1005(17), 1033(19), 1071(1), 1081(1)	L1 L2	GPS+GLO	TEST	HUN	47.79°N 19.28°E	Y	Single base	GNSMART	none	Y(B) N	1500
2101	TEST_RTK-NCT	RTK_NCT	NCT	5b(1), 5c(10), 5d(10)	L1 L2	GPS	TEST	HUN	47.79°N 19.28°E	Y	Single base	GNSMART	none	Y(B) N	1200
2101	TEST_RTK-RTCM3.2	RTK_RTCM3.2	RTCM 3.2	1005(17), 1033(19), 1074(1), 1084(1), 1230(19)	L1 L2	GPS+GLO	TEST	HUN	47.79°N 19.28°E	Y	Single base	GNSMART	none	Y(B) N	1200
2101	TEST_TRF_VRS-RTCM3.1	TEST_TRF_VRS_RTCM3.1	RTCM 3.1	1004(1), 1005(17), 1007(19), 1012(1), 1030(10), 1031(10), 1033(19)	L1 L2	GPS+GLONASS	TEST	HUN	47.79°N 19.28°E	Y	Network	GNSMART	none	Y(B) N	1200
2101	TEST_VRS-CMR_GLO	VRS_CMR_GLO	CMR	00(1), 01(17), 03(1)	L1 L2	GPS,GLO	TEST	HUN	47.79°N 19.28°E	Y	Network	GNSMART	none	Y(B) N	4000
2101	TRF_RTK-RTCM3.0-GLO	VITEL_RTK_RTCM3.0_GLO	RTCM 3.0	1004(1), 1005(17), 1007(19), 1012(1)	L1 L2	GPS+GLONASS	VITEL	HUN	47.79°N 19.28°E	Y	Single base	GNSMART	none	Y(B) N	1200

Used rovers

- **Theoretically every Galileo-capable rover should support the new MSM message types**
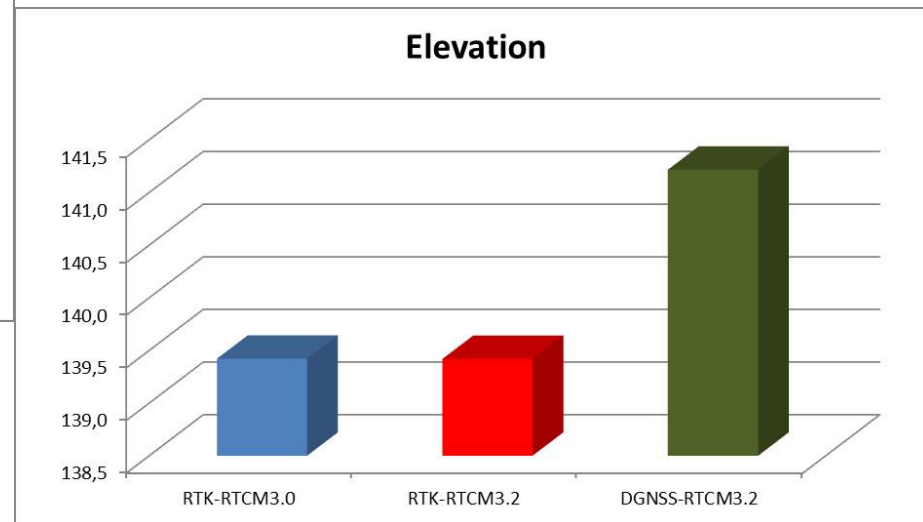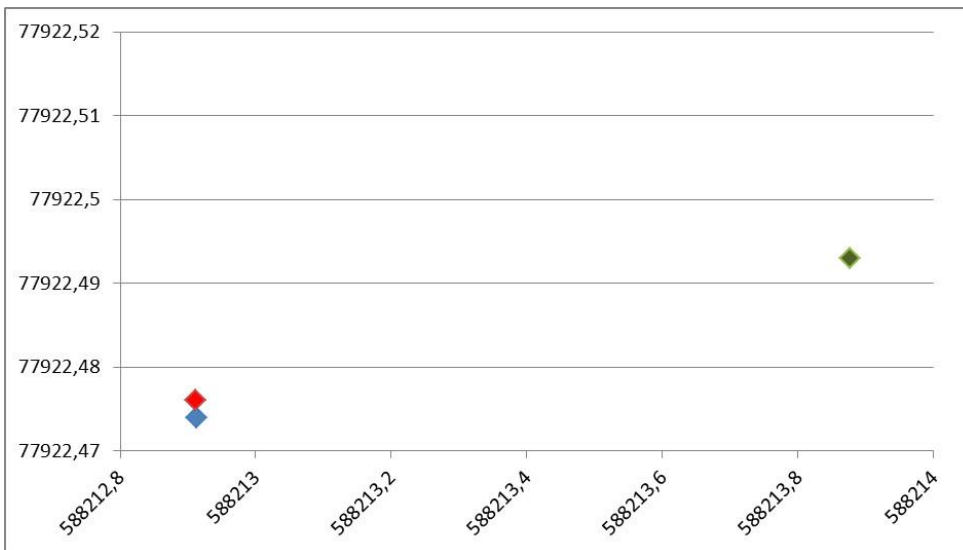
- **Javad Triump-1**

- **Spectra Precision SP80**

Javad Triump-1

- **RTK fix position is successfully achieved**

- **SD values are the smallest in case of RTCM3.2**

Javad Triump-1

- **There is some error with the DGNSS solution (using MT 1071 and 1081)**
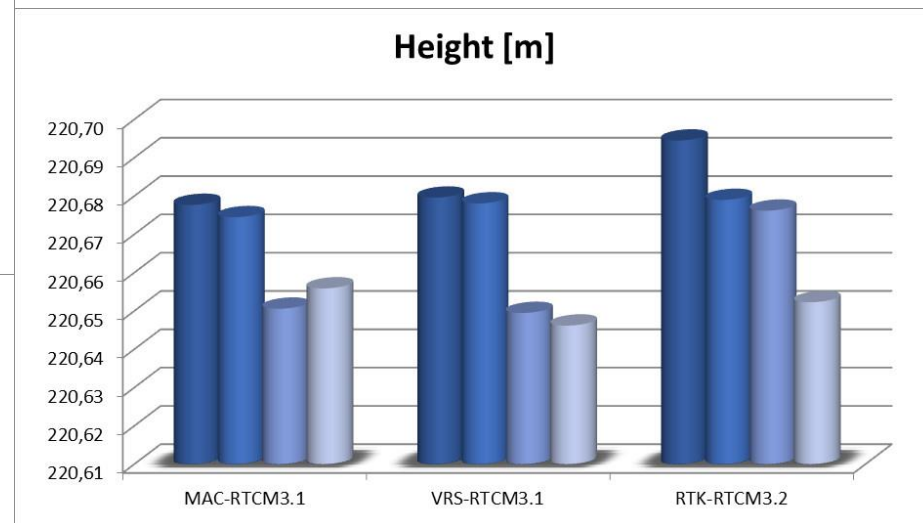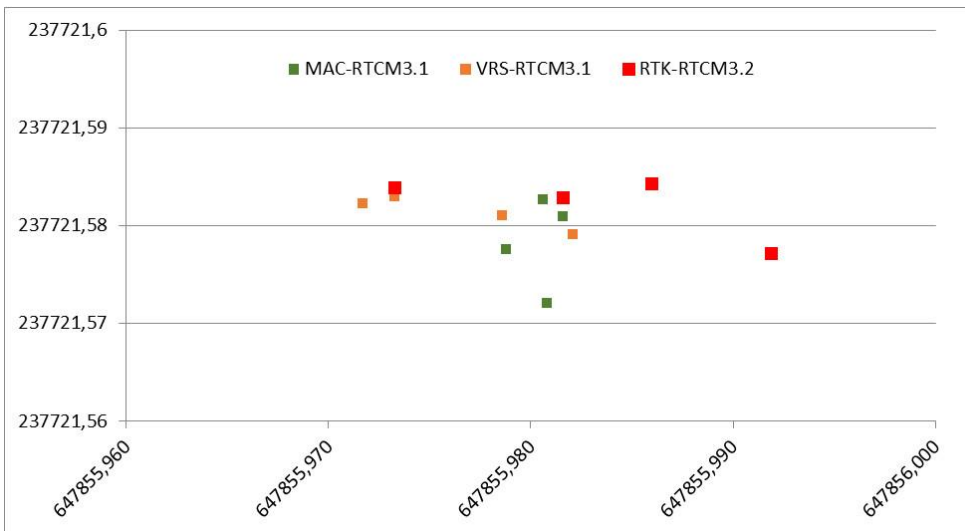
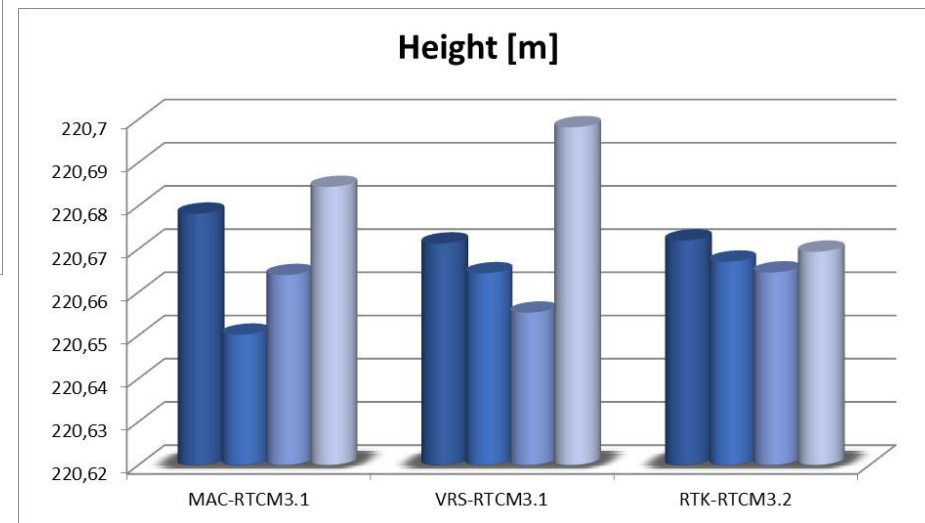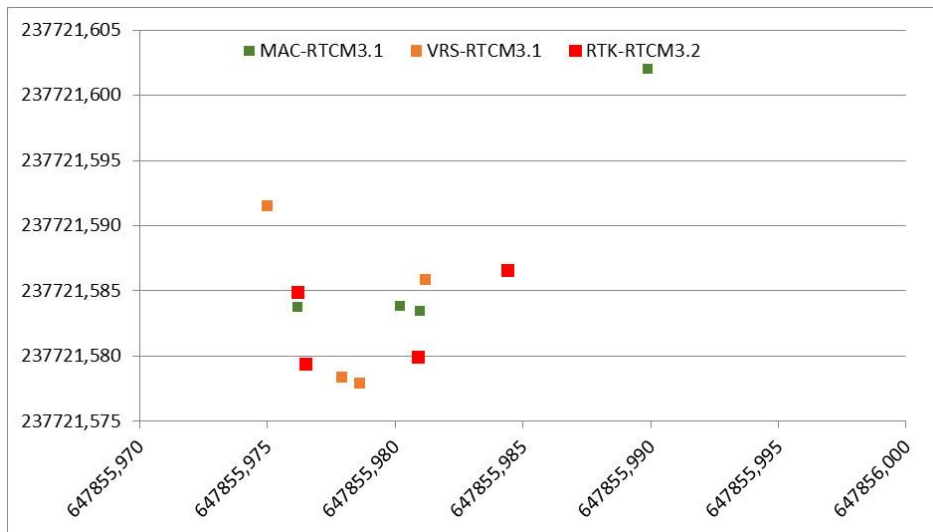- **DGPS solution not achieved → standalone coordinates**
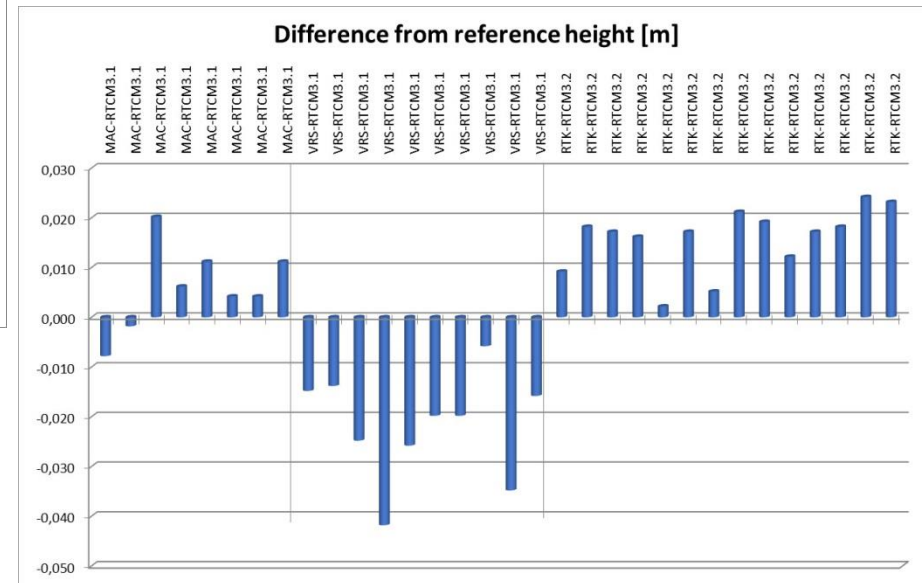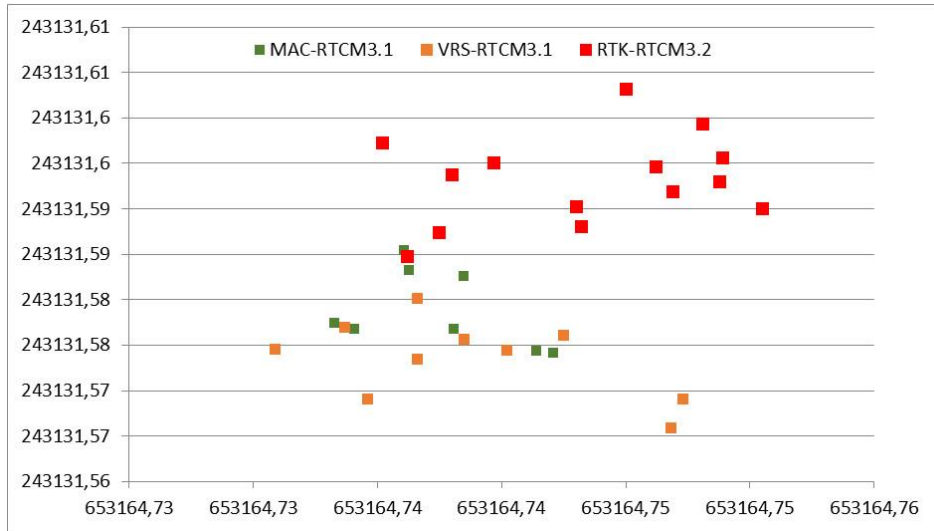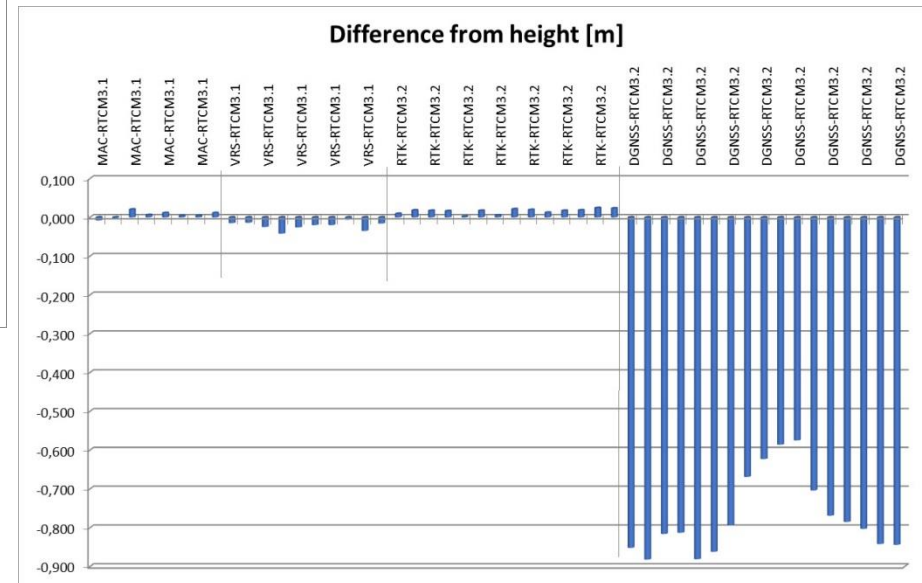
Spectra Precision SP80

Spectra Precision SP80

- **RTK fix position succesfully achieved**

- **SD values are the smallest in case of RTCM3.2**

Height [m]

Spectra Precision SP80

- **RTK fix position succesfully achieved**
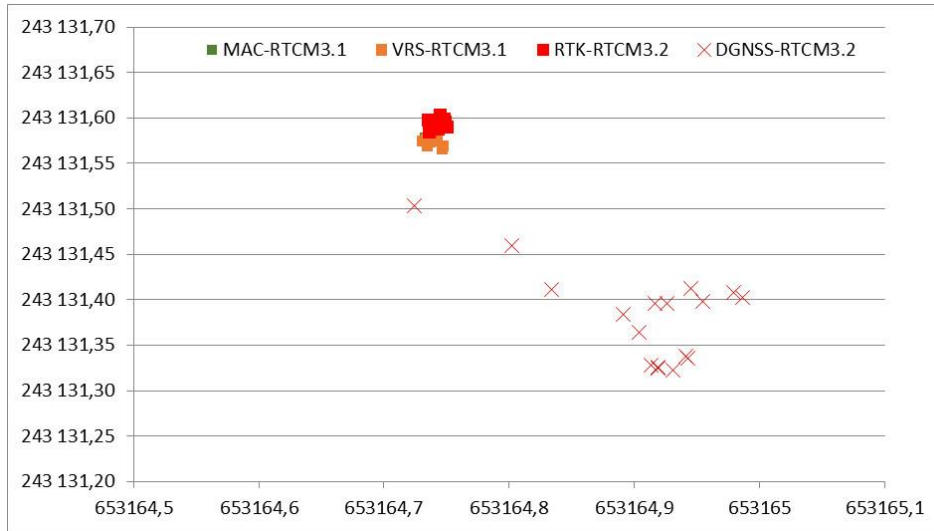- **SD values are the smallest in case of RTCM3.2**

Height [m]

Spectra Precision SP80

- **RTK fix position succesfully achieved**

- **SD values are the smallest in case of RTCM3.2**

Spectra Precision SP80

- **DGNSS position succesfully achieved**

- **Average DNGSS accuracy: 2D: 0,26 m**

  3D: 0,81 m

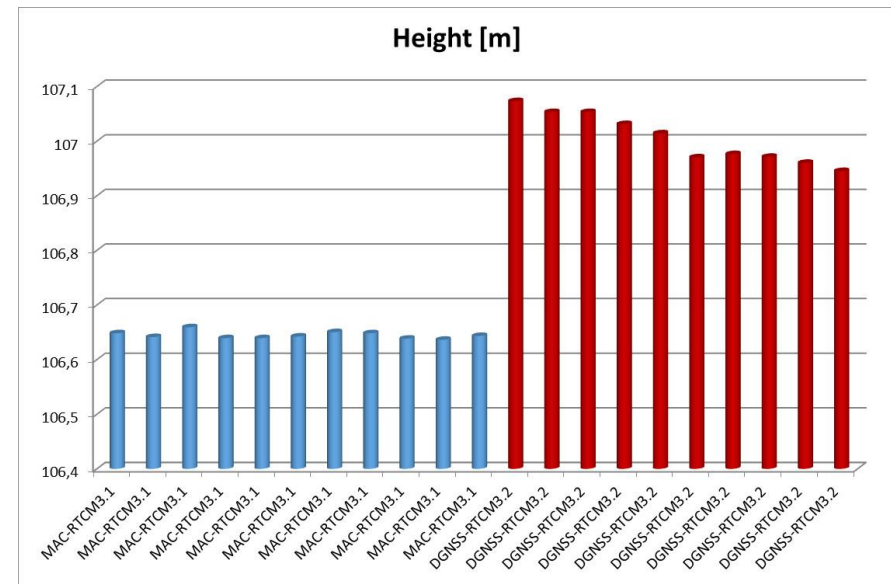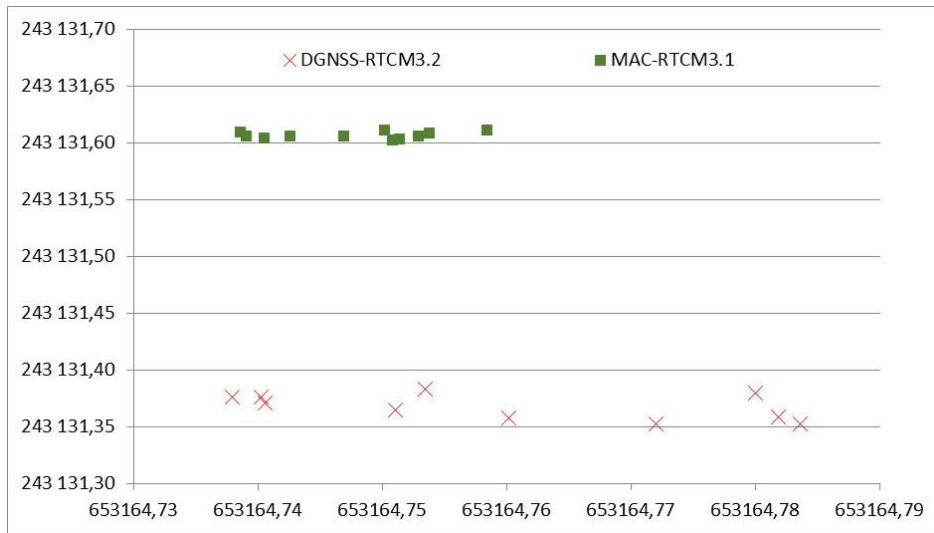 **Vert.: 0,77 m**

Spectra Precision SP80

- **DGNSS position succesfully achieved**

- **Average DNGSS accuracy: 2D: 0,24 m**
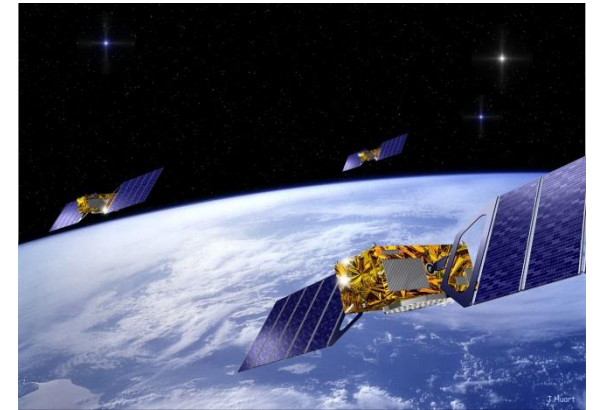
  3D: 0,35 m

  Vert.: 0,42 m

Conclusion

- **Geo++ is ready to support RTCM3.2**

    - **Other network software providers?**

- **Rover market is nearly ready to support RTCM3.2**

- **MSM messages will have real advantage when reference networks will be able to support Galileo (+ possibly Beidou) observations too**

- **Possible extension of EUPOS technical standard?**

Thank you for your attention!