

MODERNISATION OF THE HUNGARIAN GEODETIC REFERENCE NETWORKS



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[LONG AUTHOR LIST]

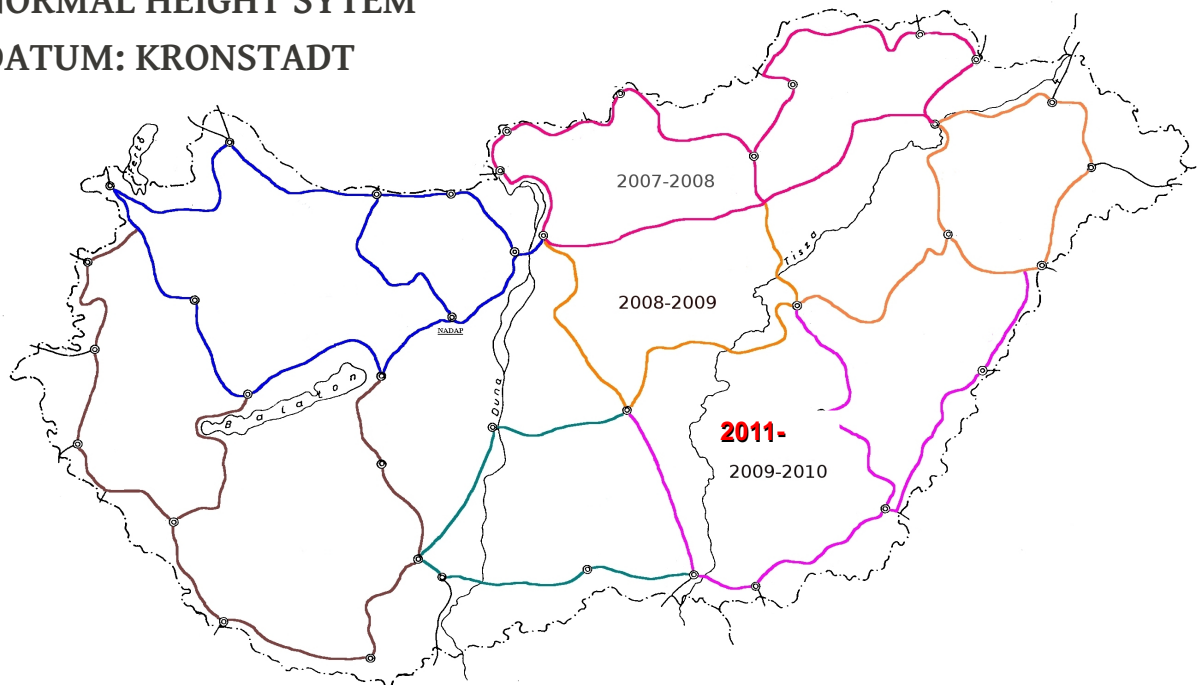
ESRS Conference, Ljubljana 24 November 2010

REFERENCE NETWORKS

- **HORIZONTAL NETWORK** **EOV**
I. ; III.-IV. order - ~ 30 000 markers
Decreased user interest / critical maintenance capacity
SELECTIVE MAINTENANCE / LEGAL ACTS ARE PREPARED
- **VERTICAL NETWORK** **EOMA**
I.-III.order - ~50000 benchmarks
RE-LEVELLING IS IN PROGRESS
- **GNSS** **GNSSnet.hu**
ETRS89
- **NETWORK INTEGRATION**
INGA: horizontal, vertical, GNSS, gravimetric networks

VERTICAL NETWORK - EOMA

- ~50000 BENCHMARKS
- I.-III. ORDER
- NORMAL HEIGHT SYSTEM
- DATUM: KRONSTADT



VERTICAL NETWORK - EOMA

- LAST MEASUREMENTS: 1975-78 (only 1st order!)
- RE-LEVELLING OF THE 1ST ORDER PART: 2007-20??
- **RELATION TO EVRS2007**
 - KEEP THE NATIONAL DATUM AND STANDARDS
 - NATIONAL DATUM POINT: NADAP (one out of the 13 EVRS2007 datum points)
 - TWO PARALEL SOLUTIONS ARE PLANNED:
 - EVRS COMPATIBLE for science and EC
 - EOMA compatible for the practice
- **PREPARATIONS FOR THE FUTURE:**
 - GNSS : creation of the height reference surface
 - InSAR : estimation of the height variation rate

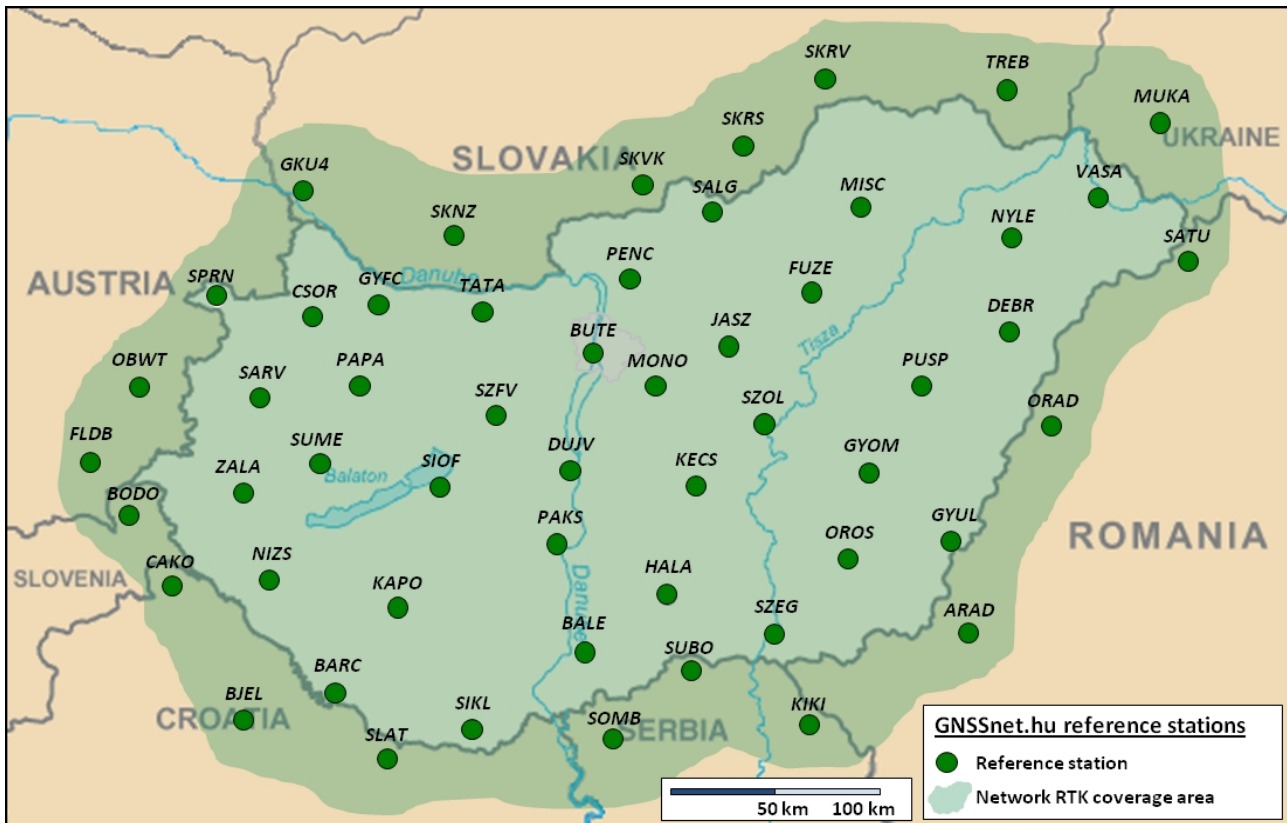
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GNSSnet.hu



GNSSnet.hu: FACTS and STATISTICS

- 35 HUNGARIAN+ 19 FOREIGN STATIONS (BILATERAL AGREEMENTS ON DATA EXCHANGE)
- 50 GNSS CAPABLE
- **NETWORKING SOFTWARE: GEO++ GNSMART**
- **>660 USER/COMPANY** and **>900 USER NAMES**
- **SIMULTANEOUS USERS: >70 AS AVERAGE**
- **75GB ANNUAL DATA DOWNLOAD**
- **99.7% SERVICE AVAILABILITY** IN 2010 JAN.-OCT.
- IDENTIFICATION AND APPROACH OF NEW USER GROUPS

GNSSnet.hu: SERVICE MONITORING

GNSSnet.hu Monitor
Hálózat | Állomás | Stream
Légkör | Skyplot

Jelenleg aktív állomások: **53 / 53** ✓

GPS hálózati/észlelt műholdak: **8 / 8** ✓

GLO hálózati/észlelt műholdak: **7 / 7** ✓

Jelenleg elérhető streamek: **17 / 17** ✓

Ionoszféra állapota nyugaton: **0.015 m** ✓

Ionoszféra állapota keleten: **0.009 m** ✓

2010-04-06 09:22 UTC

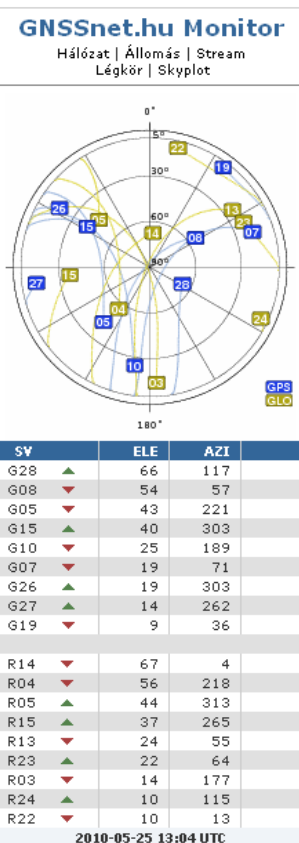
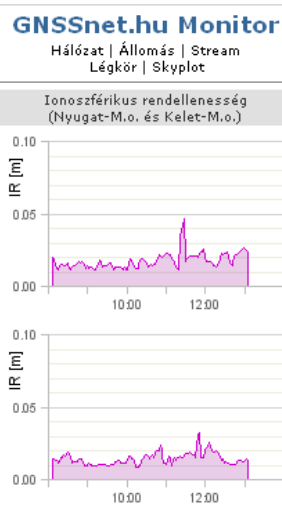
GNSSnet.hu Monitor
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NTRIP STREAM	STATUS
SGO_FKP-RTCM2.3	OK
SGO_VRS-RTCM2.3	OK
SGO_VRS-RTCM2.3_2KM	OK
SGO_VRS-RTCM2.3-GLO	OK
SGO_VRS-RTCM3.1	OK
SGO_VRS-RTCM3.1_2KM	OK
SGO_VRS-RTCM3.1-GLO	OK
SGO_VRS-CMR	OK
SGO_MAC-RTCM3.1	OK
SGO_MAC-RTCM3.1-GLO	OK
SGO_RTK-RTCM2.3	OK
SGO_RTK-RTCM3.0	OK
SGO_RTK-RTCM3.0-GLO	OK
SGO_RTK-CMR	OK
SGO_DGPS-RTCM2.1	OK
SGO_DGNSS-RTCM3.0	OK
MONO_DGPS-RTCM2.1	OK

2010-04-06 09:26 UTC

GNSSnet.hu Monitor
Hálózat | Állomás | Stream
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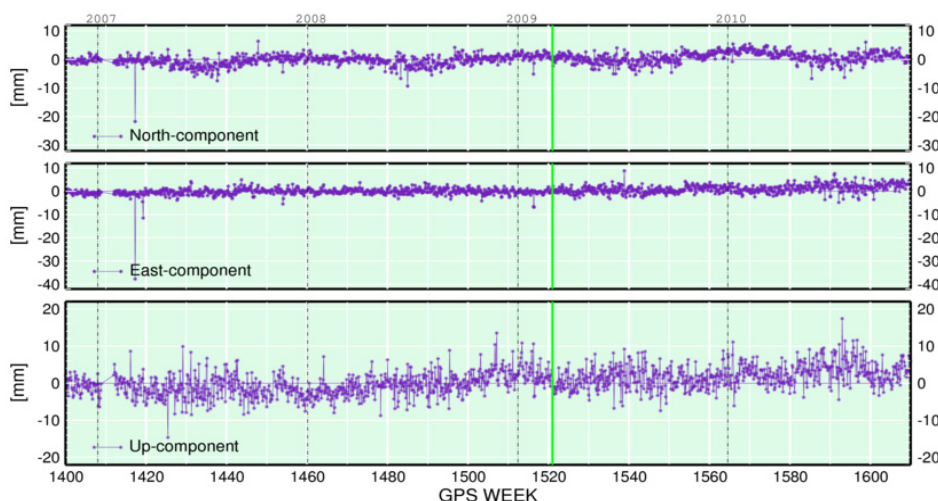
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ARAD	1d 10:14	8/8	6/6
BALE	4d 09:46	7/7	7/7
BARC	6d 00:40	7/7	7/7
BJEL	4d 09:38	7/7	7/7
BODO	4d 09:46	8/8	0/0
BUTE	4d 09:42	7/7	7/7
CAKO	0d 20:50	7/7	7/7
CSOR	6d 00:40	8/8	7/7
DEBR	23d 20:08	8/8	7/7
DUJV	6d 00:40	7/7	7/7
FLDB	0d 15:24	8/8	0/0
FUZE	54d 02:04	8/8	0/0
GKU4	0d 00:32	8/8	7/7
GYFC	6d 00:40	8/8	7/7
GYOM	39d 01:24	8/8	7/7
GYUL	1d 01:08	8/8	7/7
HALA	46d 00:58	7/7	7/7
JASZ	49d 01:56	8/8	7/7
KAPO	6d 00:40	7/7	7/7
KECS	44d 06:00	7/7	7/7
KIKI	4d 09:46	7/7	0/0
MISC	47d 02:04	8/8	7/7
MONO	37d 21:16	7/7	0/0
NISZ	4d 09:46	7/7	7/7
NYLE	46d 19:58	7/7	0/0
OBWT	3d 03:56	8/8	7/7
ORAD	1d 10:14	8/8	7/7
OROS	47d 02:22	7/7	0/0
PAKS	5d 03:38	7/7	7/7
PAPA	5d 00:34	7/7	7/7
PENC	6d 00:40	8/8	7/7
PUSP	46d 23:20	8/8	7/7
SALG	47d 20:18	7/7	6/6
SARV	4d 10:02	7/7	7/7
SATU	1d 10:14	8/8	7/7
SIKL	6d 00:40	7/7	7/7
SIOF	5d 02:42	7/7	7/7
SKNZ	4d 09:18	7/7	7/7
SKRS	4d 09:18	8/8	6/6
SKRV	4d 09:18	8/8	7/7
SKTV	4d 09:16	8/8	7/7
SKVK	4d 09:16	8/8	7/7



GNSSnet.hu: ETRS89 MONITORING

- NEW REALIZATION IN 2007 [ETRF2000(R05)]
- CROSSBORDER COMPATIBILITY OF REALTIME SERVICES (EUPOS STANDARDS AND DATA EXCHANGE)
- **DAILY MONITORING OF THE STATIONS USING BERNESE SW TO CHECK AND KEEP UP-TO-DATE THE ETRS89 COORDINATES**

ZALA_11212M001 (CLEAN)



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INTEGRATION OF THE GEODETIC REFERENCE NETWORKS

- HIGH QUALITY MAINTENANCE OF THE GEODETIC REFERENCE FRAMES USING REDUCED NUMBER OF SITES
- HORIZONTAL, VERTICAL, GNSS and GRAVITY FRAMES
- PRIMARILY BASED ON SELECTED EOMA BENCHMARKS,
- GNSS MEASUREMENTS PARALLEL WITH THE RE-LEVELLING CAMPAIGN,
- ~1000 BENCHMARKS COVERING HUNGARY
- INCREASED PHYSICAL AND LEGAL PROTECTION,
- DERIVE THE GNSS HEIGHT REFERENCE SURFACE