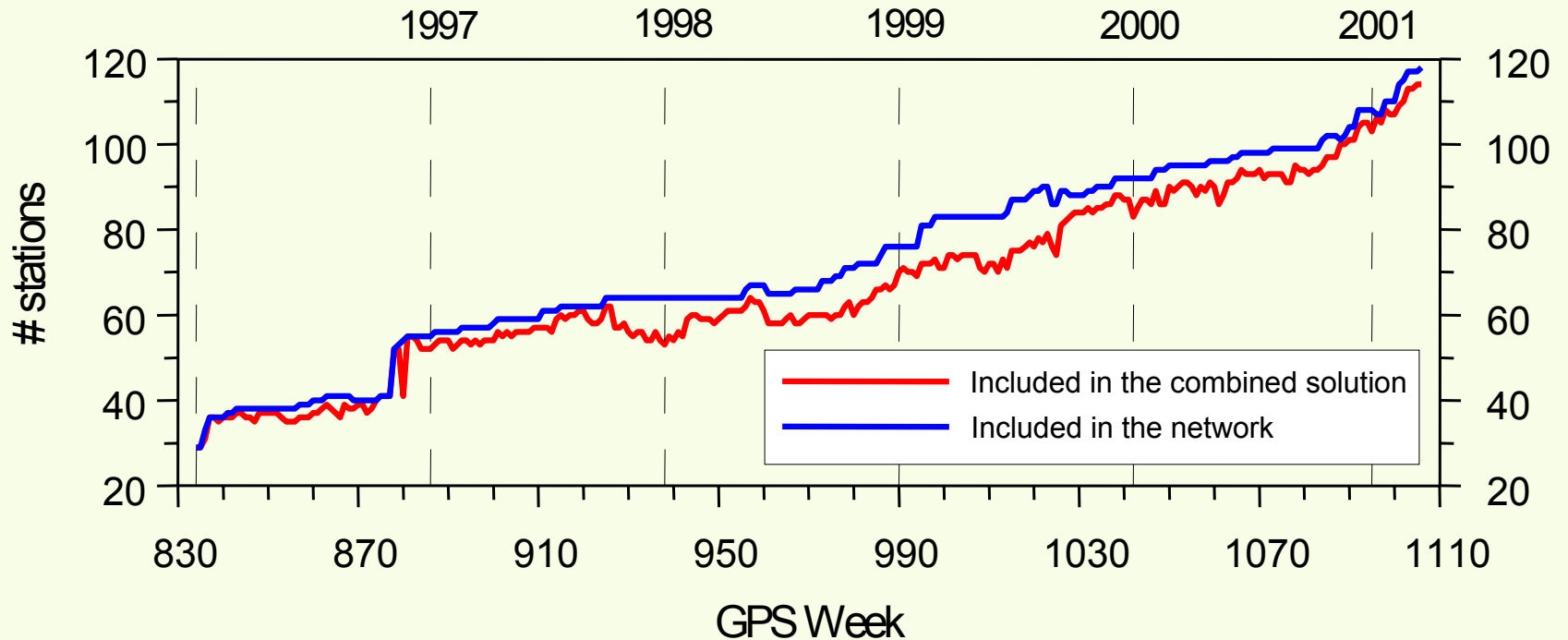


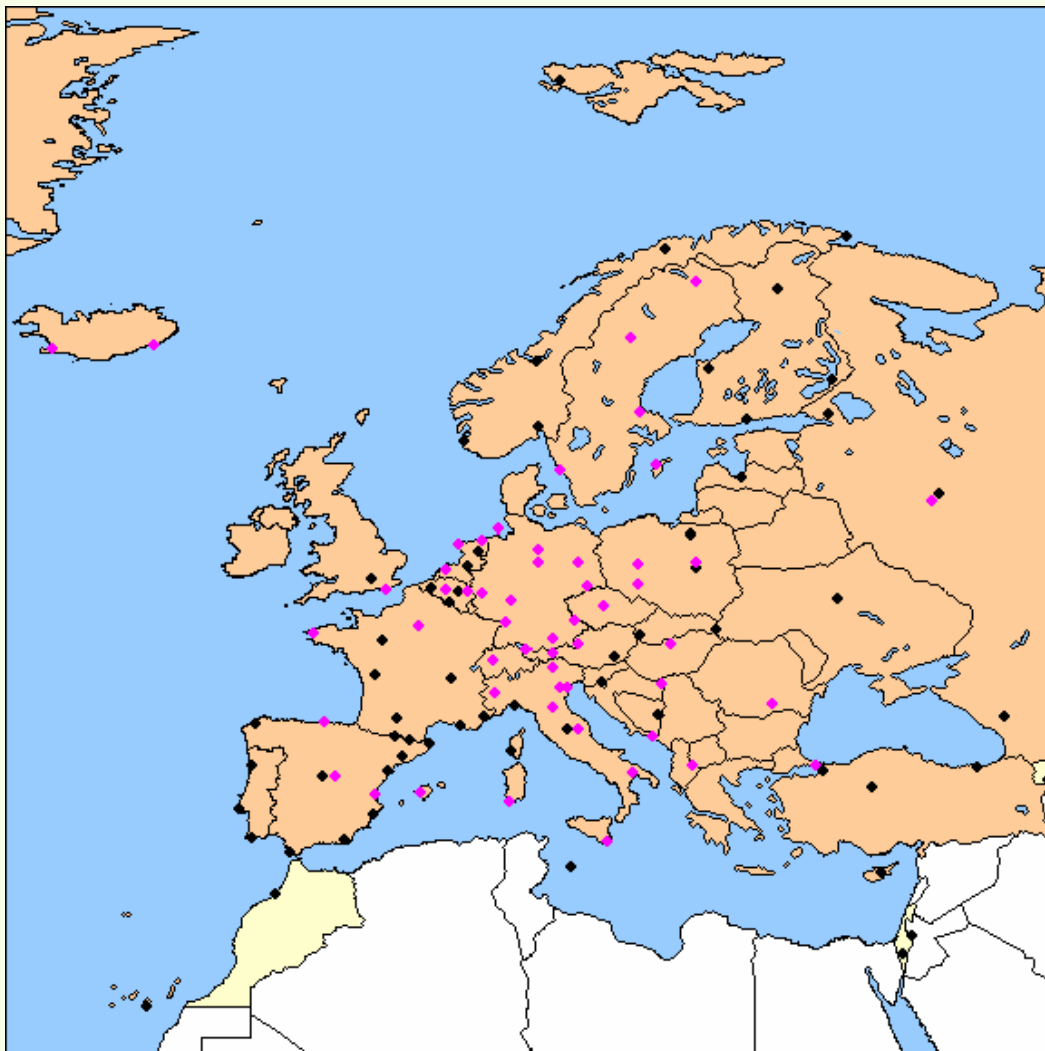
The EUREF Permanent Network

C. Bruyninx
F. Roosbeek
EPN Central Bureau
Royal Observatory of Belgium





EPN - Stations submitting hourly data (45%)



- | | |
|------|------|
| BOGO | MAR6 |
| BOR1 | MATE |
| BORK | MEDI |
| BRST | MLVL |
| BRUS | NOT1 |
| BUCU | OBER |
| BZRG | ONSA |
| CAGL | ORID |
| CAME | OSJE |
| CANT | PENC |
| DELF | PFAN |
| DRES | POTS |
| DUBR | PTBB |
| EIJS | REYK |
| EUSK | SBGZ |
| GOPE | TERS |
| HELG | TORI |
| HERS | UPAD |
| HFLK | VALE |
| HOBU | VENE |
| HOFN | VIL0 |
| ISTA | VIS0 |
| KARL | WROC |
| KIR0 | WTZR |
| KIRU | YEBE |
| KLOP | ZIMM |
| MALL | ZWEN |



EPN - Analysis Centres



AGENCY	LOCATION	SOFTWARE	START OPERATION	#/STAT.
Bayerische Akademie der Wissenschaften (BEK)	München, Germany	Bernese 4.2	October 1995	36
Bundesamt für Kartographie und Geodäsie (BKG)	Frankfurt, Germany	Bernese 4.3	December 1995	46
Warsaw University of Technology (WUT)	Warsaw, Poland	Bernese 4.2	January 1996	31
Royal Observatory of Belgium (ROB)	Brussels, Belgium	Bernese 4.2	January 1996	26
Observatory Lustbühel Graz (OLG)	Graz, Austria	Bernese 4.2	May 1996	34
Center for Orbit Determination in Europe (COE)	Berne, Switzerland	Bernese 4.3	June 1996	40
Italian Space Agency (ASI)	Matera, Italy	Microcosm 9800.0	July 1996	20
Bundesamt für Landestopographie (LPT)	Wabern, Switzerland	Bernese 4.2	November 1996	18
Nordic Geodetic Commission (NKG)	Onsala, Sweden	Bernese 4.2	December 1996	32
Geodetic Observatory Pecny (GOP)	Pecny, Czech Republic	Bernese 4.2	January 1997	29
Institut Géographique National (IGN)	Marne-la-Vallée, France	Bernese 4.2	November 1998	24
University of Padova (UPA)	Padova, Italy	Bernese 4.2	December 1998	19
Delft Institute for Earth-Oriented Space Research (DEO)	Delft, The Netherlands	GIPSY/OASIS II 2.5	March 2001	23



Day of week	Day of week	Day of week
0123456	0123456	0123456

ACOR	XXXXXXXX	AJAC	XXXXXXXX	ALAC	XXXXXXXX
ALME	-XXXXXX	ANKR	XXXXXXXX	BELL	XXXXXXXX
BOGO	XXXXXXXX	BOR1	XXXXXXXX	BORK	XXXXXXXX
BRST	XXXXXXXX	BRUS	XXXXXXXX	BUCU	XXXXXXXX
BZRG	XXXXXXXX	CAGL	XXXXXXXX	CAME	XXXXXXXX
CANT	XOXXXXX	CASC	XXXXXXXX	CHIZ	XXXXXXXX
CREU	XXXXXXXX	DELF	XXXXXXXX	DENT	XXXXXXXX
DOUR	-XXXXXX	DRAG	-----	DRES	XXXXXXXX
DUBR	XXXXXXXX	EBRE	XXXXXX-	EIJS	XXXXXXXX
ESCO	-----	EUSK	XXXXXXXX	GAIA	XXXXXXXX
GENO	XXXXXXXX	GLSV	XXXXXXXX	GOPE	XXXXXXXX
GRAS	XXXXXXXX	GRAZ	XXXXXXXX	GSR1	XXXXXXXX
HELG	XXXXXXXX	HERS	XXXXXXXX	HFLK	-----
HOBU	XXXXXXXX	HOFN	XXXXXXXX	ISTA	XXXXXXXX
JOEN	XXXXXXXX	JOZE	XXXXXXXX	KARL	XXXXXXXX
KELY	XXXXXXXX	KIRO	XXXXXXXX	KIRU	XXXXXXXX
KLOP	XXXXXXXX	KOSG	XXXXX-X	LAGO	XXXXXXXX
LAMA	XXX-XXX	LAMP	XXXXXXXX	LLIV	-----
MALL	XXXXXXXX	MANS	XXXXXXXX	MAR6	XXXXXXXX
MARS	XXXXXXXX	MAS1	XXXXXXXX	MATE	XXXXXXXX
MDVO	XXXXXXXX	MEDI	XXXXXXXX	METS	XXXXXXXX
MLVL	XXXXXXXX	MOPI	XXXXXXXX	NICO	XXXXXXXX
NOT1	XXXXXXXX	NPLD	XXXXXXXX	NSSP	-----
NYA1	XXXXXXXX	OBER	XXXXXXXX	ONSA	XXXXXXXX
ORID	XXXXXXXX	OSJE	XXXXXXXX	OSLS	XXXXXXXX
ZWEN	XXXXXXXX				

```

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|STAT| DOY | ERROR TYPE | LOG | RINEX HEADER |
-----
|CANT|141/2001|ANT. HEIGHT | 3.049 | 2.9390 |
-----

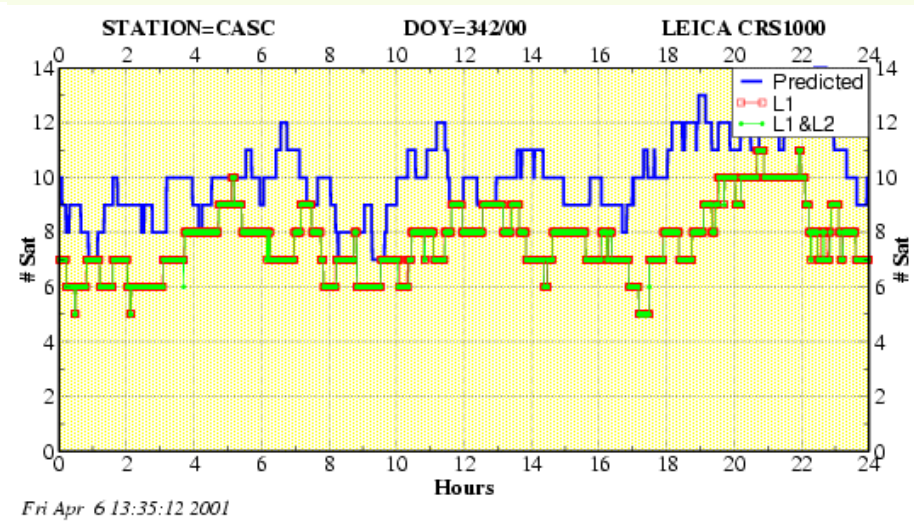
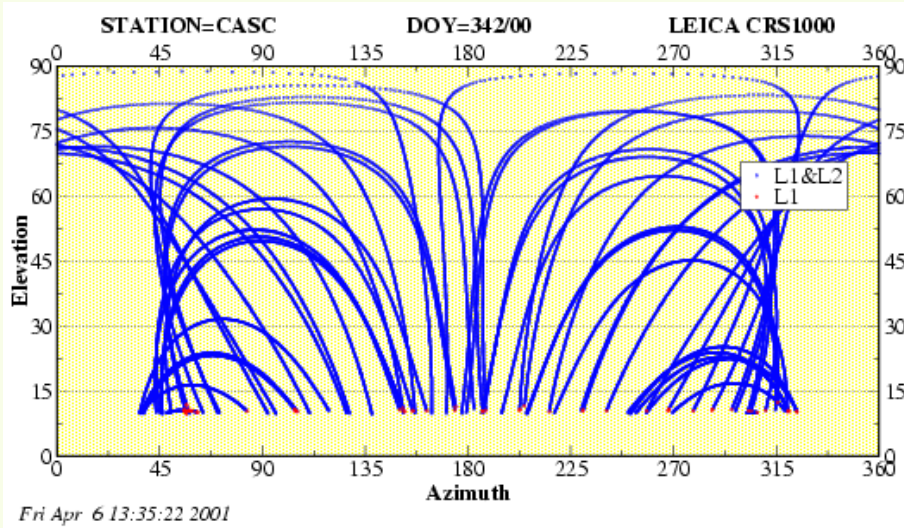
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RINEX observation data as input

Tracking performance in graphical form (EPN CB Web page)

1) azimuth/elevation angles of observed satellites

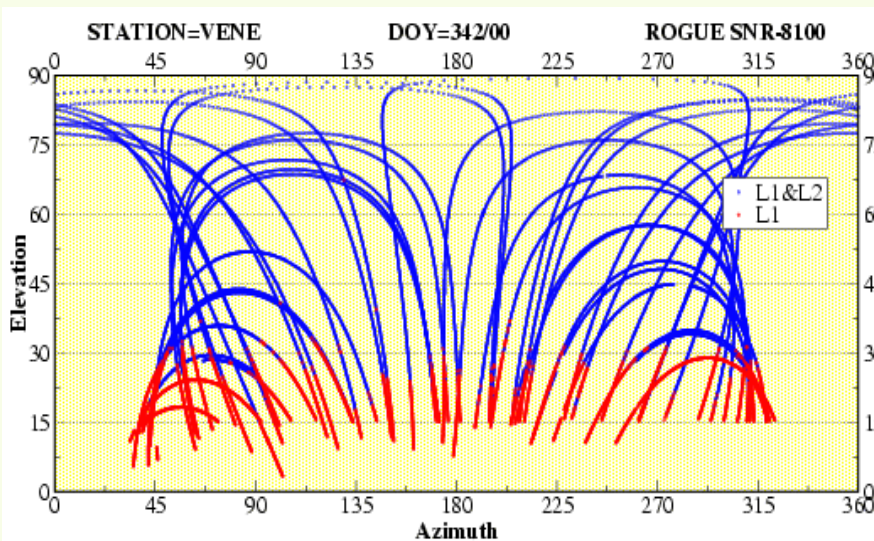
2) Number of measured satellites versus predicted number



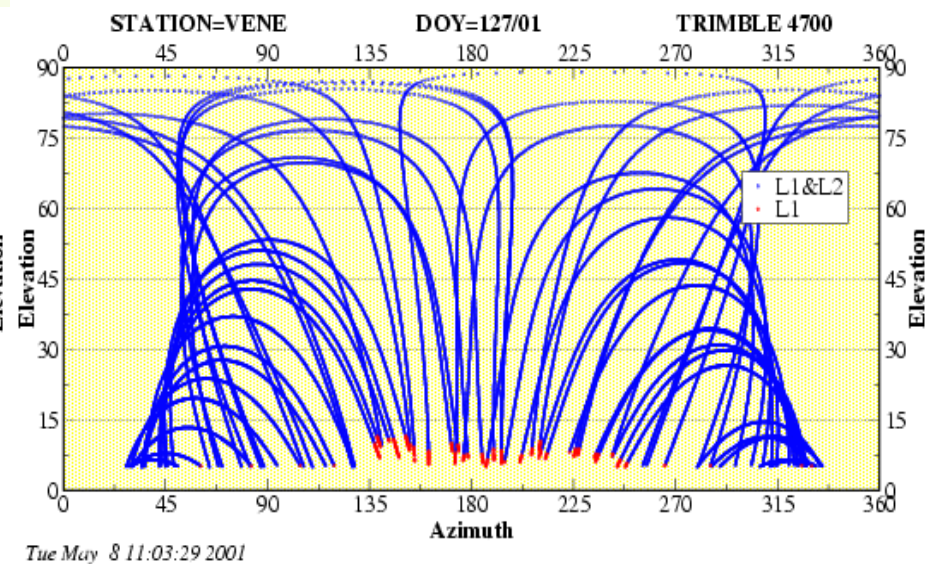
Degraded L2 tracking at low elevations

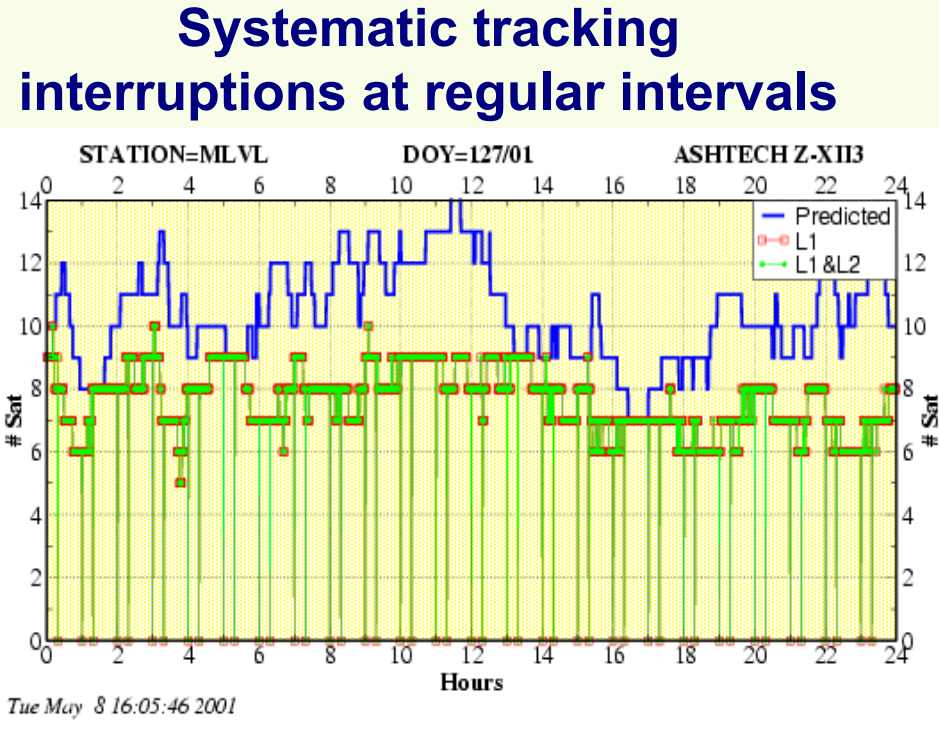
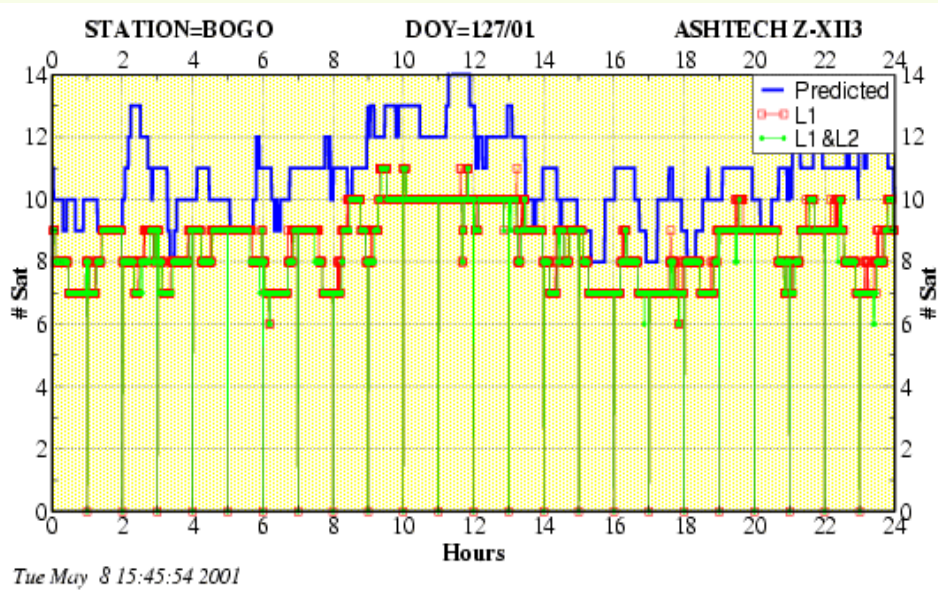
Feb1, 2001 receiver/antenna replacement

BEFORE



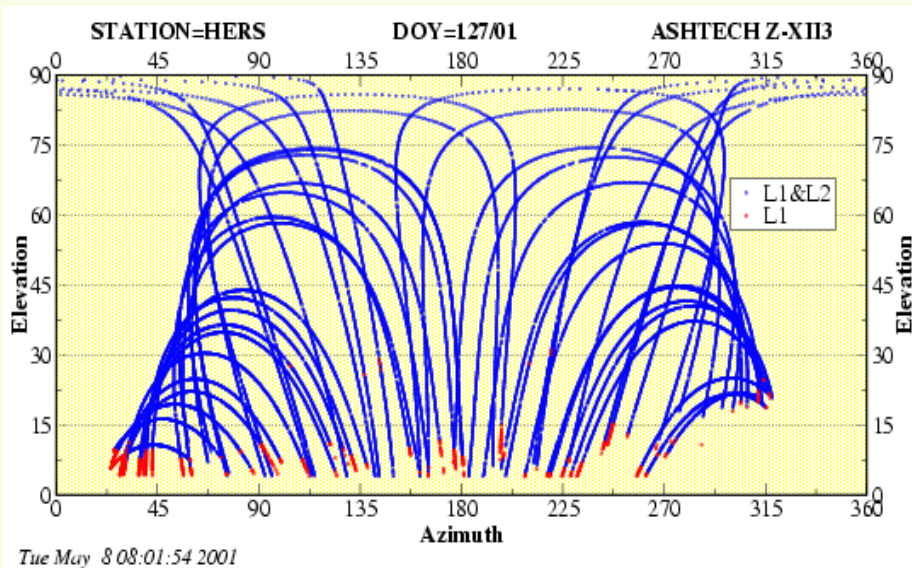
AFTER





BOGO (Borowa Gora, Poland), HELG (Helgoland Island, Germany), HERS (Herstmonceux, UK), MATE (Matera, Italy), MLVL (Marne-la-Vallee, France)

All submitting hourly data, all Ashtech Z-XII3 except MATE (Trimble 4000SSI)

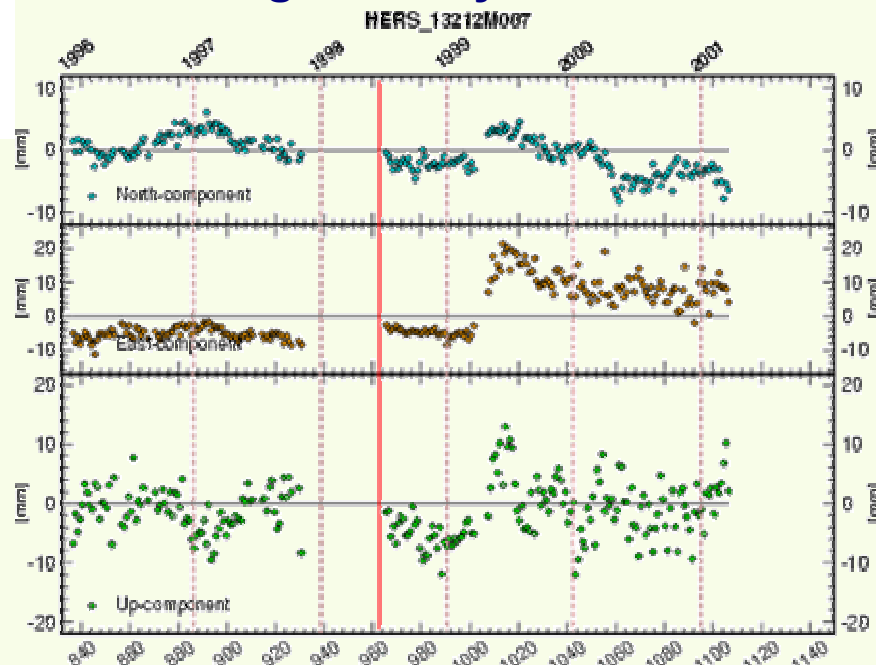


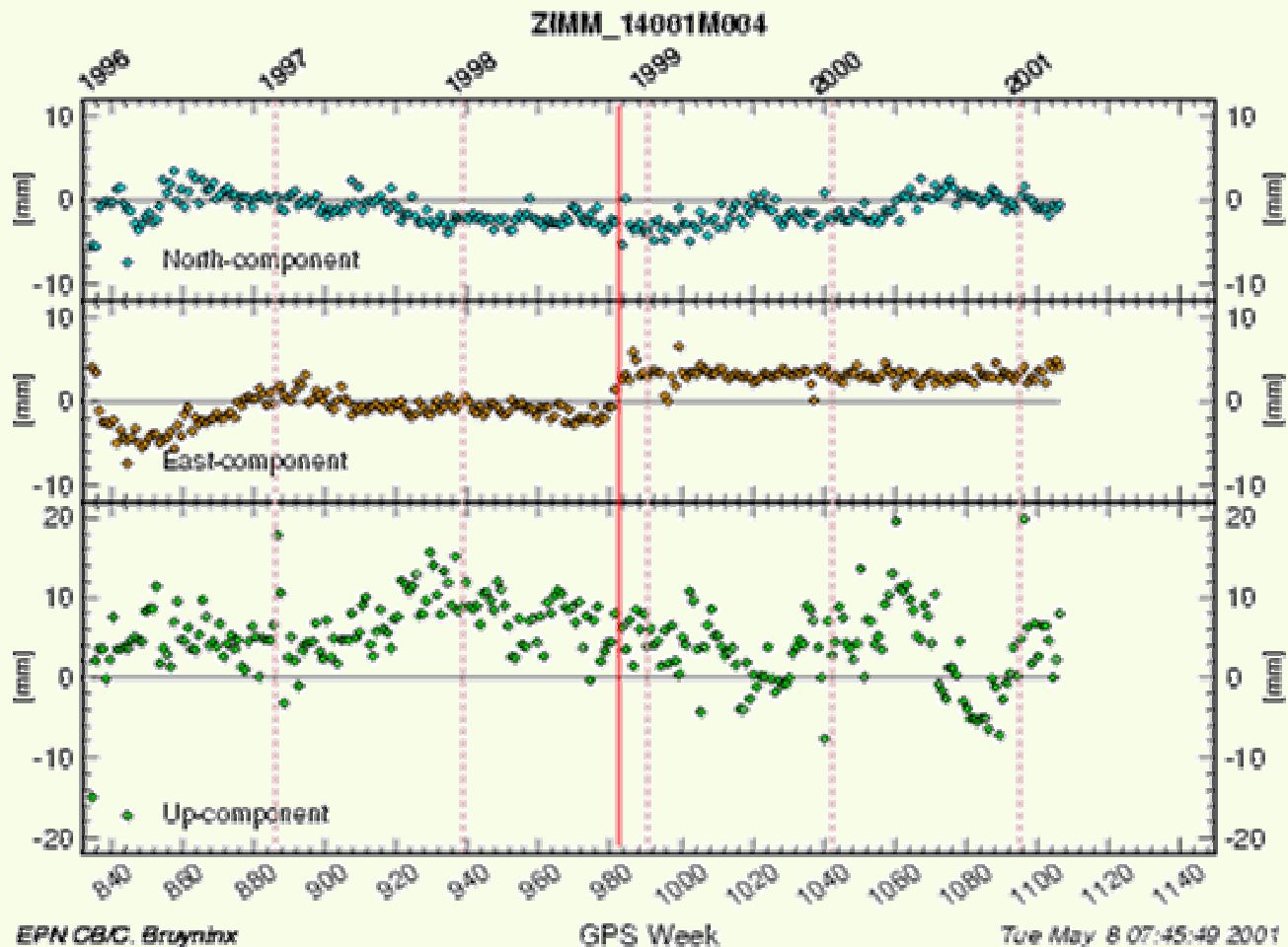
Significant obstacles

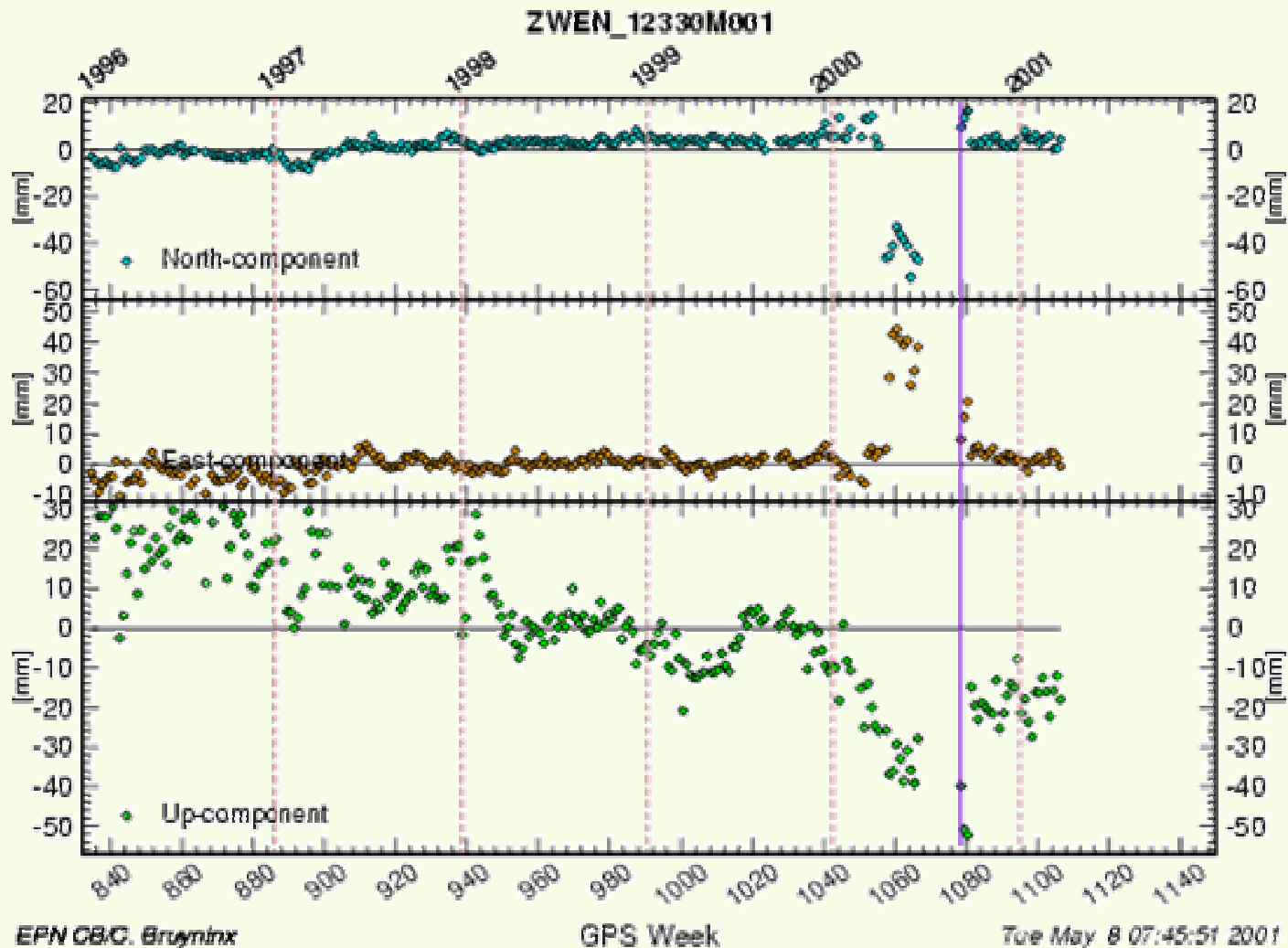
Station HERS (Herstmonceux, UK)

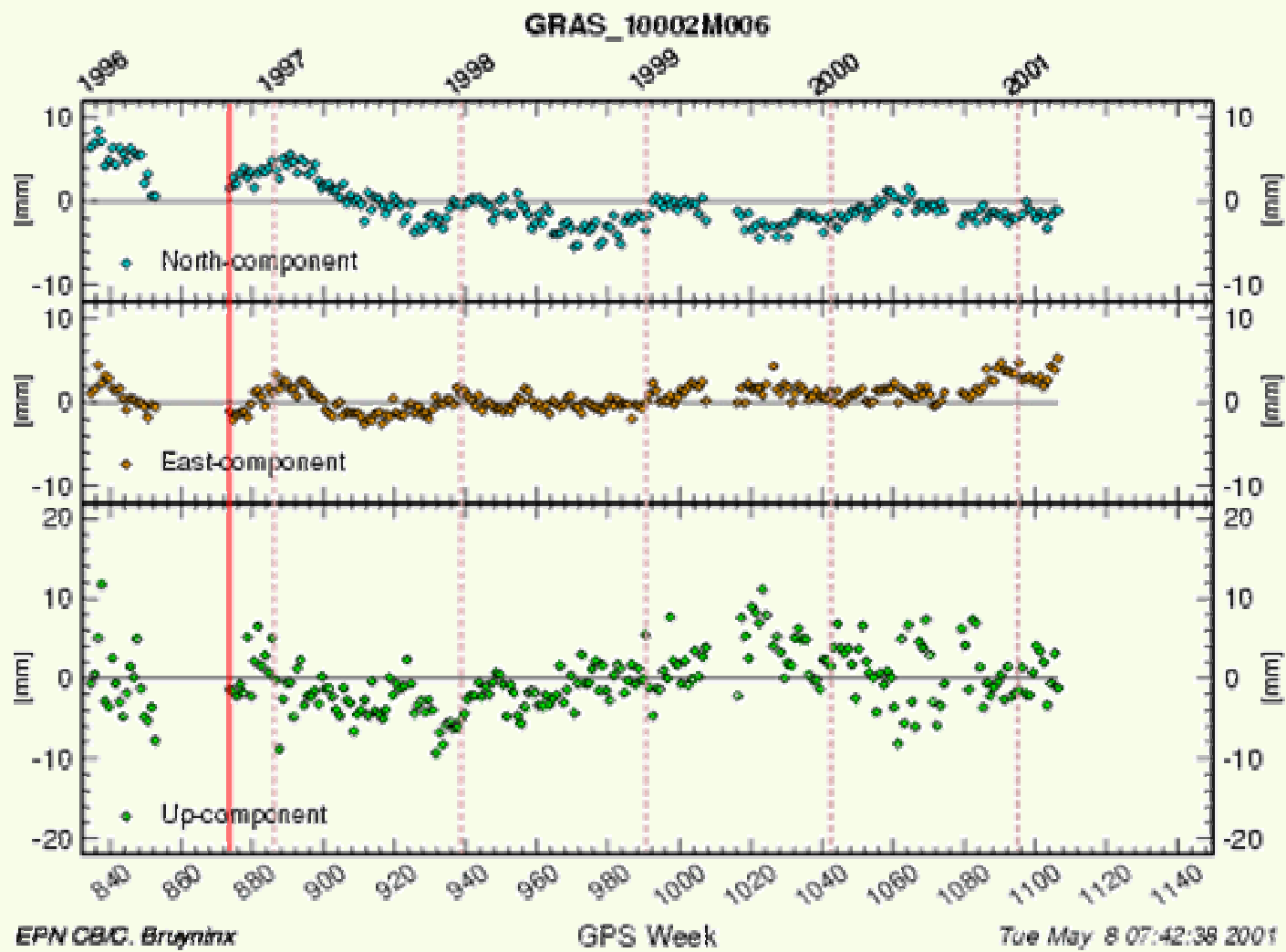
Obstacle between 270°- 340° az.
blocking visibility

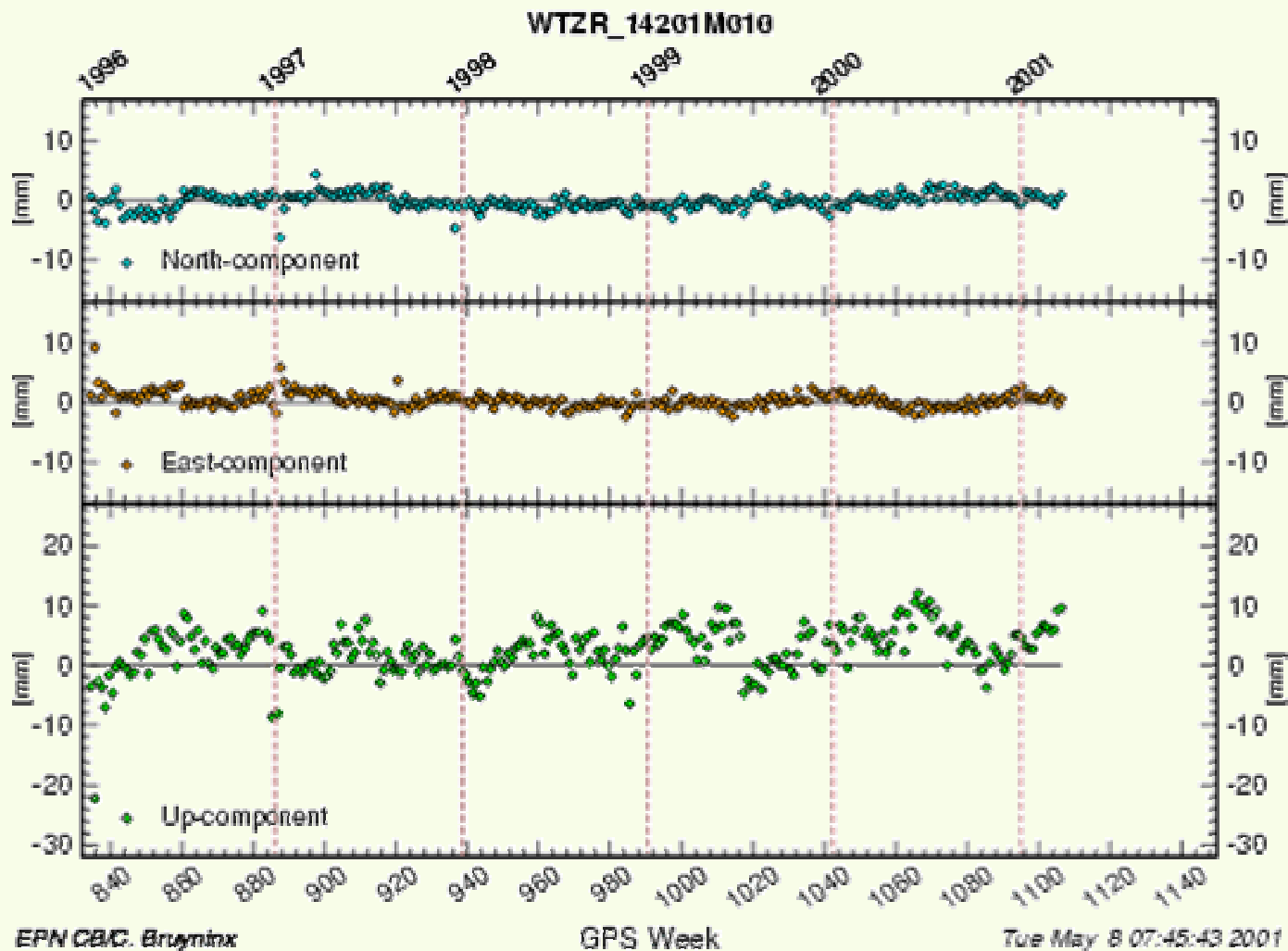
History of high noise in coordinate time series.
Jump at GPS week 1002 (March, 1999)













Mixed GPS/GLONASS Observation Files Coming Up Soon !

Mixed GPS/GLONASS IGS Precise Orbits Coming Up Soon !

- ⑤ Up to now: mixed GPS/GLONASS data follows separate Flow
 - Different data directories
 - SINEX solutions and precise orbits separate from GPS only solution

- ⑤ **IGLOS Pilot Project** **June 2001?**

International GLONASS Service

- ⑤ IGLOS sites will become bona fide IGS stations
Mixed GPS/GLONASS in same directories as GPS-only data
(RINEX V2.10 mixed GPS/GLONASS data)

Affected stations in EPN network:

GOPE, WROC (both ASHTECH Z18)

EPN CB will distribute programs to discard GLONASS part from

- **Mixed GPS/GLONASS RINEX data**
- **Mixed SP3 orbit files**



EPN Tracking Network Update of Guidelines

- Encourage installation of stations in less dense regions
- Encourage submission of hourly data

EUREF mail 691 : Nov. 24, 2000

"The site must occupy a relevant location into the EUREF Permanent Network.

For stations installed primarily to contribute to the maintenance of the ETRS89, a minimal distance of 300 km to already existing EPN stations is required, accepting the interest of each nation to have at least one EPN station.

Exceptions to this rule are possible for stations submitting hourly data or contributing to EPN Special Projects, by e.g. collocation with other instruments relevant to the purposes of EPN."



EPN New site log format

In support of GLONASS data and to improve the geophysical information available in the site logs,

- More detailed Monument Description
- Info about nearby fault zones
- Added receiver elevation cut off setting
- Added North/East Antenna eccentricity
- Added info about antenna cable type and length
- Added info about local conditions possibly affecting computed position (e.g. radio interferences, multipath sources, signal obstructions)
- Added info about local episodic effects affecting data quality (e.g. tree clearing, construction)