ANNUAL REPORT CERGOP-2/ENVIRONMENT WP2
STATION QUALITY ASSESSMENT AND UPGRADE
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INTRODUCTION

The main objectives of CERGOP Work Package (WP)-2 are defined in the project as "Setting and upgrading standards for a high level performance of the GPS network" and "Development, maintenance and extension of the CEGRN permanent and epoch station network".

THE STATUS OF THE CENTRAL EUROPEAN GPS GEODYNAMIC REFERENCE NETWORK (CEGRN)

Currently, the CEGRN network consists of 78 accepted (official) sites in 13 Central-European countries. From these sites the number of permanent stations is 41, while the number of epoch stations is 31. The CEGRN network consists of 6 inactive epoch point. On these points, GPS measurements were carried out in the former campaign, but in the last two campaign measurements were not done. These points are damaged or replaced by permanent GPS stations. Overlapping sites can also be found in the network (e.g. BUCU-BUCA, UZHL-UZHD, SNEC-SNIE, GRMS-GRMT ...).
There are 10 candidate permanent stations and 3 candidate epoch stations in the network. They took part in the CEGRN 2005 campaign, but in the time of Sarajevo working conference we had not enough information about these sites. Decision of acceptance will be later. The updated list of the official CEGRN sites and the natural and political maps of the CEGRN network can be seen on the CEGRN web site (http://www.fomi.hu/cegrn).
The current status of the CEGRN network is also shown by Pesec and Fejes in this issue.

SITE INSPECTIONS

Since the reliability of the CERGOP results depends strongly on the quality of the network, therefore very important to check whether the sites satisfy the CEGRN design concepts and site selection criteria. Other important things are the verification of the available a priory information and collection of auxiliary information related to the sites.
The formerly described methodology of inspection (Levai et all, 1998) was extended with horizon panorama photography using HOPP (Galambos and Fejes, 2003). Interference investigations were also performed using an ADVANTEST U3641 Series Spectrum Analyzer. The methodology of interference investigation were worked out in the Satellite Geodetic Observatory by Prof. Istvan Fejes and Dr. Sandor Nagy.
In the three years of EU project, the inspected permanent and epoch stations can be seen in the Figure 1. with white symbols. The not inspected sites are marked with red symbols.

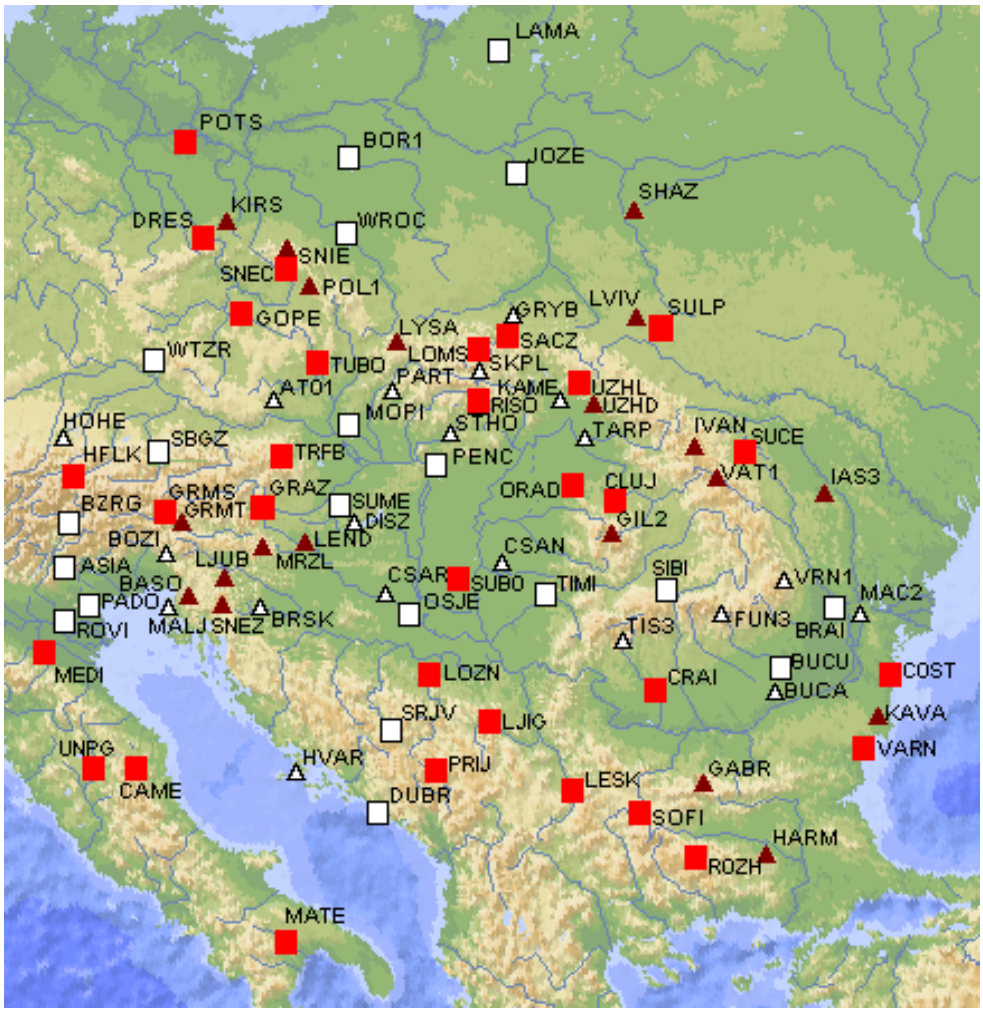

Figure 1. The inspected CEGRN sites (white symbols)

In the last year of EU project, the following permanent and epoch stations were inspected :

TIMI	**Timisoara**	**2005. August**	**ROM**	**Perm.**
TIS3	**Tismana**	**2005. August**	**ROM**	**Epoch**
BUCA	**Bucharest-Magurele**	**2005. August**	**ROM**	**Epoch**
BUCU	**Bucharest**	**2005. August**	**ROM**	**Perm.**
BRAI	**Braila**	**2005. August**	**ROM**	**Perm.**
MAC2	**Macin**	**2005. August**	**ROM**	**Epoch**
VRN1	**Vrancea**	**2005. August**	**ROM**	**Epoch**
FUN3	**Fundata**	**2005. August**	**ROM**	**Epoch**
SIBI	**Sibiu**	**2005. August**	**ROM**	**Perm.**
SRJV	**Sarajevo**	**2005. November**	**BIH**	**Perm.**
BZRG	**Bolzano**	**2005. November**	**ITA**	**Perm.**
ASIA	**Asiago**	**2005. November**	**ITA**	**Perm.**
PADO	**Padova**	**2005. November**	**ITA**	**Perm.**
ROVI	**Rovogo**	**2005. November**	**ITA**	**Perm.**
MALJ	**Malija**	**2005. November**	**SLO**	**Epoch**
BOZI	**Bozica**	**2005. November**	**SLO**	**Epoch**

In Bressanone/Brixen (Italy), planned permanent station was also inspected.

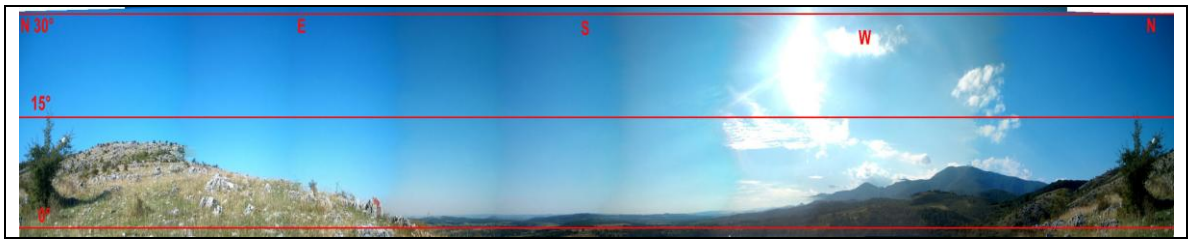

Figure 2. Horizon photography of TIS3

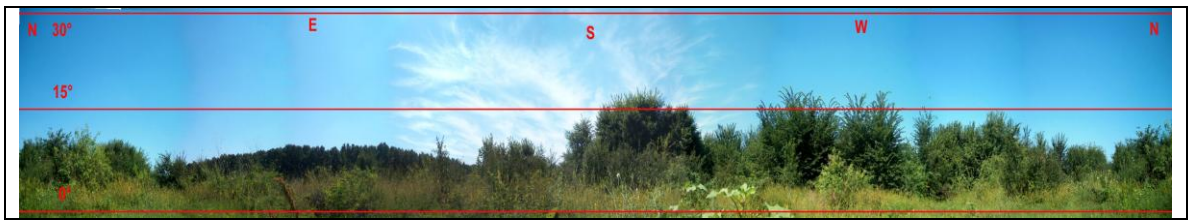

Figure 3. Horizon photography of BUCA

The site selection in Romania was very good. The epoch stations except Bucharest-Magurele are placed in bedrock, without any significant obscuration above 15° (e.g. see Figure 2., 3.). But unfortunately at Vrancea epoch station near to the point marker a new fence was created last year, which causes significant obscuration. In the Figure 4. can be seen the horizon photography at the level of the adapter and in the Figure 5. at the level of tripod head. Due to the significant obscuration at CEGRN'05 GPS campaign, the Romanian colleges performed GPS measurement at the top of a tripod instead of adapter. They also performed 5–day measurements at a new marker near to the old poin in the same time.

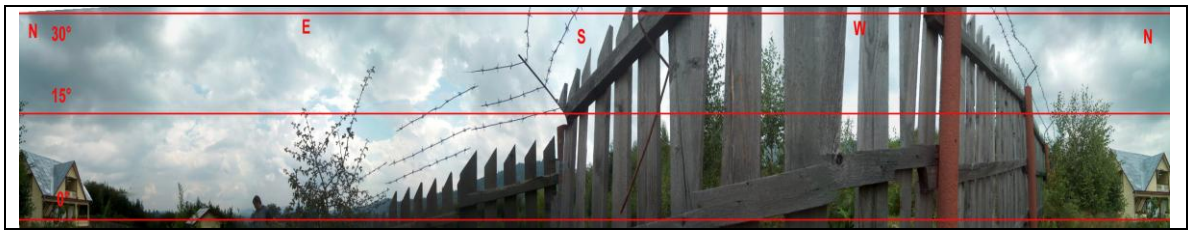

Figure 4. Horizon photography of VRN1 at the level of adapter

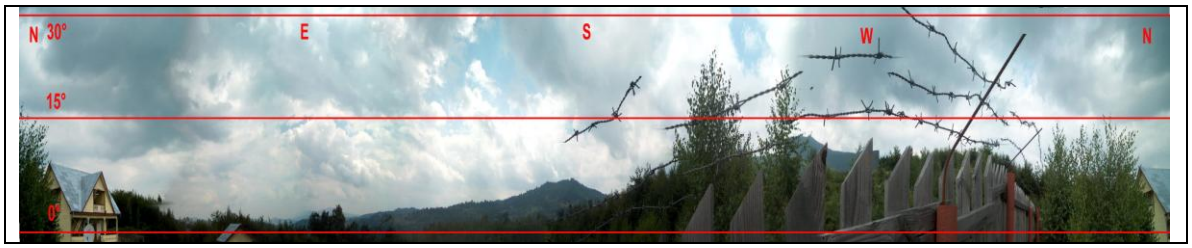

Figure 5. Horizon photography of VRN1 at the level of tripod head

The site selection of the inspected Romanian, Bosnian and Italian permanent stations are typical. Antenna placed on the top of building anchored to the roof with steel construction. The antenna holder of ASIA seemed the weakest construction among the inspected CEGRN sites, unacceptable by any standards. In March 2006 it was damaged probably due to wheather conditions (Figure 6.).

Figure 6. Antenna holder of ASIA originally (left) and after damage (right)

The two Slovenian inspected epoch sites are placed in bedrock, without any significant obscuration (e.g. Figure 7.).

Figure 7. Horizon photography of BOZI

The monumentations of Slovenian epoch sites are good. Metal marker is placed in bedrock in Bozica and placed into rockbase pillar in Malija. Antenna setting up can be performed by rigid metal adapter. At Romanian epoch sites the marker only a small bored hole in the bedrock (see Figure 8) which is not satisfactory. This way the antenna height can not be measured so precisely.

Figure 8. Marker of TIS3 and FUN3.

The results of interference measurements in all Romanian ans Slovenian stations show good conditions for GPS measurements. Only on few pictures can be seen not significant signals (see Figure 9.). At Italian sites Bolzano and Padova GPS L2 frequency was strongly disturbed (see Figure 10.).

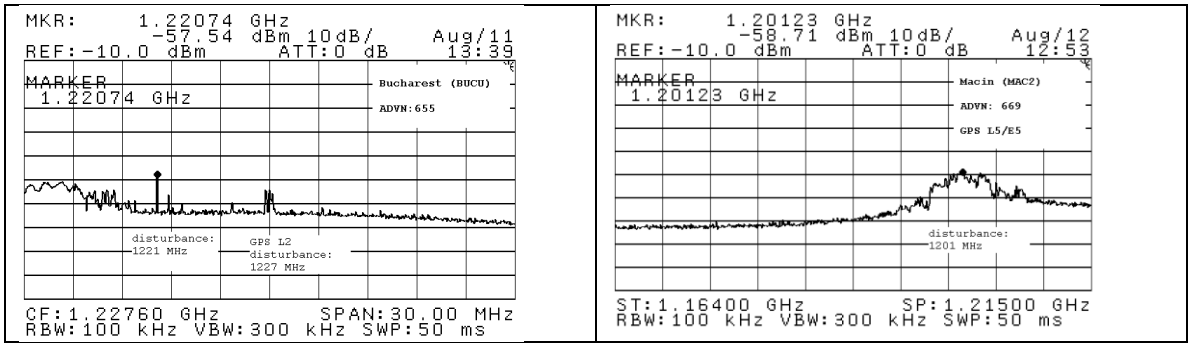

Figure 9. The band near GPS L2 frequency in Bucharest (left), and the band of GPS L5 and Galileo E5 in Macin (right)

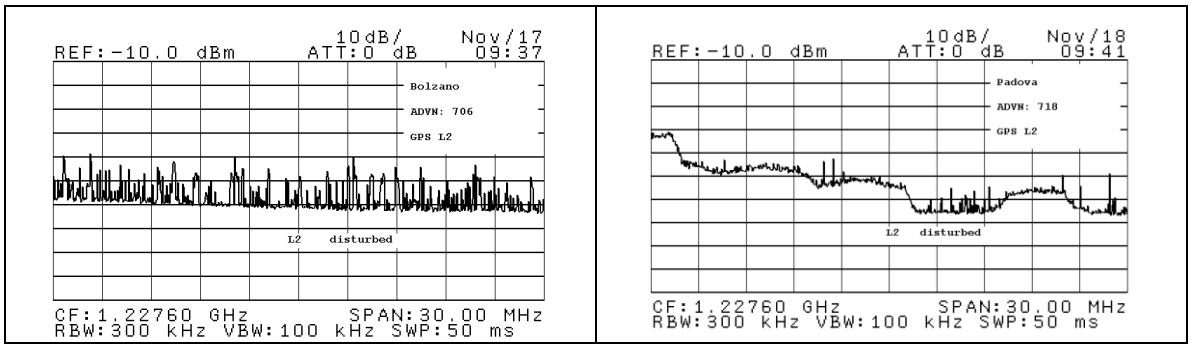

Figure 10. The band near GPS L2 frequency in Bolzano (left) and in Padova (right)

FUTURE PLANS

Updating and enlarging of the existing CERGOP Site Catalog and continuous data service for the web site of CERGOP Consortium are important tasks in future. We also would like to continue the site inspections for all not inspected sites, in the case of necessity extended with interference investigations.

ACKNOWLEDGMENTS

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