

XXXIVth Meeting of the EUREF Technical Working Group in Budapest, March 22 – 23, 2004

Next events:

- EUREF TWG symposium meeting: Bratislava, Tuesday, June 1, 2004
- EUREF Symposium 2004: Bratislava, Wednesday, June 2 - Friday, June 4, 2004 (Saturday, June 5 technical excursion).2004
- EUREF TWG fall meeting: Prague, Monday, November 8 - Tuesday, November 9, 2004

New EUREF homepage: <http://www.euref-iag.net/>

Meeting place: Oktatói Klub, Technical University Budapest

Begin: 22.3.2004, 13.30 am; end: 23.3.2004, 12.20 am..

Agenda

1. Minutes of the 33rd TWG Meeting in Frankfurt
2. EUREF Terms of Reference
3. Certification of Non-EUREF GPS Permanent stations
4. ITRF, GALILEO and EUREF relationship
5. Re-computation of GB 2001 campaign
6. EPN data flow
7. EPN Network update
8. EUREF Real-Time Project
9. Introduction to Omnistar and Skyfix
10. EUREF-Troposphere Project
11. Status of the EPN Time Series Analysis Special Project
12. European Velocity Field
13. Status of the EUVN Densification Action
14. Status of ECGN and UELN
15. Nordic levellings and the Baltic loop: a status report
16. ESEAS update
17. COST716, EUMETNET and role of EUREF in GPS Meteorology
18. Actions of the ExG G of EuroGeographics
19. Short report on EGGP, IAG Commission 2
20. EUREF Symposium 2004 Bratislava
21. Varia
 - a. Next TWG meetings
 - b. TWG members
 - c. EUREF campaign in Romania
 - d. Protection of the name and logo for EUREF

Participants

JÓZSEF ÁDÁM, Budapest (guest) (22.3.)
 ZUHEIR ALTAMIMI, Paris (Chairman)
 ELMAR BROCKMANN, Berne
 CARINE BRUYNINX, Brussels
 ALESSANDRO CAPORALI, Padova
 DUSAN FERIANC, Bratislava (guest)
 WERNER GURTNER, Berne
 HEINZ HABRICH, Frankfurt (perm. guest)
 BJØRN HARSSON, Honefoss
 HELMUT HORNIK, Munich (Subcomm. Secretary)
 JOHANNES IHDE, Frankfurt

AMBRUS KENYERES, Budapest
 MATEJ KLOBUSAK, Bratislava (guest)
 JAAKKO MÄKINEN, Helsinki
 HANS VAN DER MAREL, Delft
 HANS-PETER PLAG, Honefoss (guest)
 HERMANN SEEGER, Bad Neuenahr – Ahrweiler (perm. guest)
 JAROSLAV SIMEK, Prague
 GÜNTER STANGL, Graz (perm. guest)
 JOAO AGRIA TORRES, Lisbon (Subcomm. President)
 HANS VISSER, Leidschendam (guest) (22.3.)
 GEORG WEBER, Frankfurt

Minutes

Remark: The presented papers and view graphs can be received, as far as available, on request from the EUREF secretary. Furthermore, some texts are published on the EUREF homepage (http://www.euref-iag.net/html/twg_meetings_documentation.html).

The new elected TWG chairman, ZUHEIR ALTAMIMI, opens the XXXIVth meeting of the EUREF TWG in Budapest. He thanks AMBRUS KENYERES as representative of the TU Budapest for the invitation and arranging the meeting in the TU Budapest. Z. ALTAMIMI welcomes especially the guests who were invited to give reports on special topics.

The agenda was distributed among the TWG members by mail and is adopted by the plenary after some small additions.

1. Minutes of the 33rd TWG Meeting in Frankfurt

The minutes of the XXXIIIth TWG Meeting Frankfurt a.M., November 10-11, 2003, are accepted after some small corrections. The text can be found in the EUREF homepage (<http://www.euref-iag.net/TWG/EUREF%20TWG%20minutes/TWG%20Frankfurt%20minutes.pdf>).

2. EUREF Terms of Reference

J. TORRES presents the revised version of his text to this topic. He explains his ideas how to proceed in the EUREF Subcommission for the near future, especially considering the new structure of the IAG (<http://www.gfy.ku.dk/~iag/HB2004/part1/15-IAGStructure.pdf>). A critical point is the membership of some European countries in the EUREF Subcommission. Traditionally all countries are invited to take part in the tasks of EUREF, however, the IAG distinguishes clearly members and non-members. EUREF on the other side is closely connected to EuroGeographics, too. This organisation also distinguishes full, pending and non-members, whereas a few European countries are neither included in the member list of IAG nor EuroGeographics.

Z. ALTAMIMI points out that the IAG clearly offers rules defining members, which normally are represented by organisations, and people, so EUREF also should follow these rules. H. SEEGER objects that Europe has a rather in-

homogeneous structure and up to now the EUREF Subcommission is working very well. So one should avoid to put up too many rules which are not necessary in practice but could be in the way for the daily work. As example the definition of the geographic boundaries is mentioned, in this case some countries as Turkey or Russia are part of Europe and Asia as well. Likewise the EPN already has some stations in random countries which are no part of Europe, the EPN sites, however, are of great interest for EUREF are therefore included in the project.

W. GURTNER emphasizes that with the terms of reference now the basic features of EUREF, but no time limited activities should be handled. All colleagues are asked to send their comments basing on this discussion to J. TORRES to prepare an updated version and to distribute it again among the TWG members to be handled again at the next meeting and finally be presented to the coming EUREF 2004 symposium in Bratislava.

3. Certification of Non-EUREF GPS Permanent stations

Introducing J. TORRES explains the motivation for this action which was initiated by A. CAPORALI at the TWG Meeting in Paris, March 2003. The EPN comprises a large number of stations which fulfil clearly defined specifications (http://www.epncb.oma.be/_organisation/guidelines/index.html). Besides these sites meanwhile numerous other stations exist which fulfil the specifications but are not included in the EPN due to the guidelines for a limited density. So it was discussed whether it might be useful to give the label "EUREF quality" to such stations. The benefit for EUREF would be an improved familiarity of the EPN at all and EUREF could become an accepted body for quality assessment in this matter. Moreover the NMAs, EuroGeographics and other agencies could use such stations for eg. national densifications or special projects.

W. GURTNER emphasizes that an essential item of EPN stations consists in their long term quality and maintenance which is permanently controlled by the EPN computing centre. Therefore this aspect has to be applied also for non-EUREF GPS Permanent stations as well. It has to be reflected very carefully how to fulfil this request.

The TWG members are asked to send their comments to J. TORRES to revise this draft for a new discussion at the next TWG Meeting in Bratislava.

4. ITRF, GALILEO and EUREF relationship

In place of C. BOUCHER, Z. ALTAMIMI presents a series of viewgraphs (http://www.euref-iag.net/html/twg_meetings_documentation.html). concerning the liabilities of the ITRF and the new development of GALILEO as well as the relationship of EUREF to these projects. The ITRF is installed by the IERS which is organized as a non governmental international cooperative service. To guarantee the long term availability and reliability of the ITRF, adequate data are needed. So the high accurate long-term data records of EUREF represent an important input. Therefore the mutual cooperation of ITRF and EUREF should be intensified aiming for a legal status of EUREF within the ITRF.

Concerning GALILEO, EUREF is invited to take actively part in the development and to send a representative to the next meeting in Paris.

Z. ALTAMIMI asks all colleagues interested in these item to contact him for further cooperation.

5. Re-computation of GB 2001 campaign

Z. ALTAMIMI mentions a letter by M. GREAVES informing that in the computation of the EUREF GB2001 GPS Campaign (cf. Resolution No. 1, EUREF Symposium Ponta Delgada, Azores, 5 - 8 June 2002, <http://www.euref-iag.net/html/resolutions.html#PDelgada>) an error has been detected just recently. This error distorts the coordinate values in the range of some mm up to the cm level, a new computation has been carried out. Z. ALTAMIMI is asked to contact M. GREAVES to prepare an updated report and to circulate the text among the TWG members at least two weeks before the Bratislava 2004 Symposium. As usual the TWG then will evaluate the results and propose the presentation to the Symposium.

6. EPN data flow

On behalf of the EPN Coordination Group, G. STANGL presents his ideas on updated guidelines for new EPN stations, operational centers and an alternative EPN data flow in order to avoid any loss of data for the case that an Data Center would be off from the net. In such cases, the data flow has to be directed immediately to another DC. This option requests a reliable information system covering the whole network of stations and DCs enabling the automatical diversion in the case of failures. An unsolved problem would occur if more than one centers do not work in the same time. For this case it is recommended that the EPN sites always keep backups of their data for a certain time period. To ensure the correct reconstruction of interrupted data records, adequate procedures have to be developed which allow the identification and merging of partial files on an utmost automatic level.

It is concluded that all data are to be stored at two data centers. Then procedures are to be developed and tested to meet the case of breakdown of more DCs.

H. HABRICH and G. STANGL are asked to work out a proposal and circulate it asap among the TWG members for discussion and following steps at the next TWG meeting.

7. EPN Network update ()

C. BRUYNINX presents her report on the newest development of the EPN. Since March 2004 three new sites have been included in the EPN, i.e. Ganovce/Slovakia, Cercivento/Italy and Torino/Italy (cf. <http://www.epncb.oma.be/trackingnetwork/maps.html>). An application from Iran to adopt a site in the EPN is discussed. Considering that Iran is very far off from Europe, it is decided to propose the Iranian colleagues to contact the IGS to join their station in this network.

8. EUREF Real-Time Project

G. WEBER presents a series of viewgraphs on this item. The input data are delivered from numerous different projects involved in many applications, so the ordering of the data streams and the construction of a continuous data flow requests a sophisticated software and organisation. In the same the various users have many different requests. It was decided to charge the users by 500 EURO for the software.

At the next meeting the further progress in this project will be reported.

9. Introduction to Omnistar and Skyfix

Introducing to this topic, Z. ALTAMIMI mentions that a co-operation of EUREF with commercial agencies is generally welcome. Especially for real time application a benefit for both sides could be gained.

In the following H. VISSER (http://www.euref-iag.net/html/twg_meetings_documentation.html) presents the work of the positioning company Omnistar/Skyfix. The company employs about 9000 people in 200 offices distributed over 50 countries. The main The FUGRO group (www.fugro.com) runs among others a survey division which is responsible for positioning, mapping and charting, geological advice and support services for developments. The activities are related to the surface and subsurface of the earth and the seabed and of the man-made structures built upon it. The organisation is closely related with Thales, but both are operating their own systems in order to be able to deliver data to the users in the case of any failure.

At the moment about 100 permanent GPS sites are used, the frame is related to the ITRF2000. For the future the Networked Transport of RTCM via Internet Protocol (Ntrip) is a very promising tool.

In the discussion it is pointed out that use of EUREF data at least partly depends on the permission of the individual NMAs. Z. ALTAMIMI emphasizes that Omnistar could help a lot to install a continental reference frame for Africa (AFREF), on this continent up to now there are nearly no "official" permanent stations. H. VISSER will check this special item in the company for probable further steps and inform the TWG in this matter. G. Weber is asked to keep the contact with H. Visser.

10. EUREF-Troposphere Project

G. WEBER distributes a paper and reports on the recent work. At some EPN sites more than one receivers are installed observing simultaneously. The data records are analyzed separately. Assuming that the atmospheric conditions for these stations are identical, the differences in the results may allow to draw conclusions on the various receiver/antenna combinations. Concerning these activities, the BKG is also contributing to the COST-716 near real time campaign since March 2004.

11. Status of the EPN Time Series Analysis Special Project

A. KENYERES explains the recent steps in the project. As general aspects the items identification, estimation, elimination of outliers, offsets from the EPN coordinate time series, improved time series plots on the web, velocity estimation of the EPN sites are to be listed. Meanwhile the project is also included in the EPN homepage (http://www.epncb.oma.be/_organisation/projects/series_sp/index.html), showing offset and outlier database, estimated velocities (XYZ, NEU, RES), velocity maps. The long term goal is to improve the accuracy and reliability of the EPN for a highest level to form the best data base for the ETRF and frame definition.

12. European Velocity Field

Z. ALTAMIMI explains the need to install an European velocity field presented by the EPN stations to allow an accurate positioning within the ETRS89. As input the weekly combined EUREF SINEX files and the CATREF (Combination and Analysis of Terrestrial Reference Frames) software working on a minimum constraint approach are used. The output should comprise a list of regularly updated station positions and the respective velocities as well as describe coordinate shift discontinuities. It should be discussed at the next meeting whether an updated version of memo of BOUCHER & ALTAMIMI should be written.

Z. ALTAMIMI will install a draft “unofficial” website collecting all information on the topic “velocity field”, the TWG members are asked to send their comments.

It is proposed to present a contribution to the project “Europvel” by EUREF at the WEGENER meeting in Morocco, September 2004.

13. Status of the EUVN Densification Action

A. KENYERES reports that phase A - data collection with end of 2003 could only partly be completed as not all countries delivered the requested data. However, a number of new observations carried out in the last time is available, the analysis shows some interesting results. J. SIMEK emphasizes that most of outliers are due to levelling or geoid errors, so the colleagues in the countries should be contacted to check the possible influences. A. KENYERES will present an updated report at the Bratislava meeting.

14. Status of ECGN and UELN

J. IHDE informs on the present status of these two projects. In October 2003, after time consuming efforts, the data of Bulgaria finally could be included into the United European

Levelling Network (UELN). The current adjustment version comprises about 3700 nodal points, 5100 measurements and 1500 degrees of freedom. The standard deviation for 1 km levelling line is estimated with 1.13 kgal @mm. It is expected to receive further data of the area of the Baltic Sea, i.e. from Denmark and Sweden. The visit of a Russian delegation in the BKG in early 2004 led to a discussion on the exchange of levelling data with Russia. In the south-east of Europe the data of Turkey and Greece still are missing, a change of the current situation cannot be seen.

A more detailed report will be presented to the next meeting on occasion of the 2004 EUREF Symposium in Bratislava.

Concerning the activities on the European Combined Geodetic Network (ECGN) a first working group meeting was held in Frankfurt in September 2003, a second meeting is planned for May 2004. For further information cf. <http://bkg.bund.de/ecgn>, this website contains guidelines and forms with links to different observation techniques. C. Bruyninx mentions that some stations proposed for the ECGN are not yet part of the EPN. Therefore the station managers should be stimulated to take care for joining the EPN.

15. Nordic levellings and the Baltic loop: a status report

Connected to the previous topic, J. MÄKINEN gives a status report on the activities in the Nordic countries. The transformation of the European National Height Datums into the EVRF2000 Datum showed for the Baltic area a difference of nearly 1 dm between the Helsinki and the Kronstadt tide gauge datums. It can be adopted that the EVRF 2000 has a misclosure in this area. Unfortunately up to now no data for a levelling connection around the Baltic Sea are available. It is not yet really clear whether this situation will be improved in the next future. In order to come to a result, oceanographic levelling and GPS observations will be used. In any case the Nordic Geodetic Commission (NKG) will closely work together with UELN. Special consideration in the Nordic countries is given to the modelling of an adequate model for the postglacial rebound (PGR).

16. ESEAS update

H.-P. PLAG summarizes the activities since his last report to the TWG in March 2003. The pilot project for the European Sea Level Service (ESEAS), started in August 2001 will end with July 2004, an assessment report is in preparation. The decision on a possible continuation will be taken in summer 2004. The project was funded up to now by the European Community. For the case of a continuation a new call for participation will follow afterwards.

At present a considerable amount of tide gauge data is collected in the ESEAS data server where they are controlled. The data structure is organized similar to the IGS data. As a main result H.-P. PLAG emphasizes that ESEAS stimulated successfully the tide gauges stations for a better cooperation.

ESEAS has invited EUREF to send an official delegate. H. HABRICH is nominated to represent EUREF in this organisation.

17. COST716, EUMETNET and role of EUREF in GPS Meteorology

H. VAN DER MAREL informs on this topic. The COST716 Action was started in March 1998 and will be finished in March this year. Altogether 15 European countries participated. For the NRT demonstration started in 2001, in March 2004 finally 420 stations and 10 ACs took part (<http://www.wknmi.nl/samenw/cost716.html>). GPS data were provided from IGS, EPN, NMAs, national meteorological Services, universities, research institutes and private companies.

As conclusion of the action, it can be stated that the experiment fulfilled all expectations such as the operational requirements in terms of timeliness and accuracy, ZTD values are used directly for NWP, timely available GPS data provide valuable input for validation and monitoring, new nowcasting applications can be developed.

For the near future the experiences of COST 716 will be used in Targeting Optimal Use of GPS Humidity Measurements in Meteorology (TOUGH). Further at the final COST 716 Workshop (December 2003, De Bilt/Netherlands) the creation of an project within the European Meteorological Services Network (EUMETNET) as an organisation of National Meteorological Services was proposed. The project is planned to be started in 2005. The task to organize a geodetic interface to the EUMETNET was directed to H. V. D. MAREL, E. BROCKMANN, H.-P. PLAG and G. GENDT. As potential benefits for the GPS community item such as cost sharing and use of meteorological products and services are to be mentioned. A cooperation with EUREF would be highly welcome.

The TWG concludes to discuss at the next meeting the install of a special working group on EUMETNET. E. BROCKMANN, H. V. D. MAREL, Z. ALTAMIMI and J. TORRES will contact EUMETNET for sending a representative to present a report to the EUREF symposium in Bratislava.

18. Actions of the ExG G of EuroGeographics

J. IHDE gives a summary of the session of the Expert Group on Geodesy (ExGG) in the morning of March 21. As the majority of members in the ExGG are members of the TWG as well, the sessions are generally organized together. EUREF could help by providing its products to support the community to learn about reference systems and their application. It is hoped to finish the terms of reference till the next meeting in June 2004 Bratislava.

Malta and Moldova have asked the BKG to give technical support in installing each one permanent GPS station in their

countries. The TWG approves the plan of the BKG to give the requested support.

19. Short report on EGGP, IAG Commission 2

J. IHDE informs on the EGGP as a new project of the IAG. A Steering Committee was set up to install a European group. As a first step a data set in an Alpine region as topographically difficult area will be tested. The concerning countries were asked to deliver usable data for this analysis. First results should be presented to the next IUGG General Assembly 2007 in Perugia.

20. EUREF Symposium 2004 Bratislava

M. KLOBUSIAK reports on the preparations for the EUREF Symposium in Bratislava from June 2 - 5, 2004. The TWG asks the LOC to complete the homepage concerning the Symposium (e.g. exchange rate Slovak Crowns - EURO). As in Toledo successfully applied, the ppt files for beamer presentations generally are to be stored on CD or power stick and delivered to the LOC so that all presentations can be projected from one PC.

21. Varia

a. Next TWG meetings

The next TWG meeting will take place the day before the EUREF Symposium in Bratislava, i.e. on June 1, 2004.

J. SIMEK invites the TWG to hold the fall meeting 2004 in Prague. The TWG thankfully accepts the invitation and fixes the date for Monday - Tuesday, November 8 - 9, 2004.

b. TWG members

B. HARSSON informs that he will retire in February 2005, so the TWG should think about a successor in this body.

c. EUREF campaign in Romania

G. STANGL informs shortly on a GPS campaign for EUREF in Romania. The status of the results, however, is rather draft. G. STANGL is asked to keep the contacts to R. FORSBERG and Romania for a possible presentation to the next EUREF Symposium.

d. Protection of the name and logo for EUREF

B. HARSSON mentions that after a series of previous letters by the IAG, the EUREF President and Norway he has received a letter dated from November 3, 2003, in which the Danish authorities inform that there is no more rejection against the protection of the name "EUREF".

