48th Meeting of the EUREF Technical Working Group in Munich, 3. – 4. November 2008

Next events:

- 2009 TWG Spring Meeting: Thursday, 26. February – Friday, 27. February 2009, noon to noon, Budapest.
- TWG 2009 Symposium Meeting: Florence, 26 May 2009 (whole day)
- Symposium 2009: 27 – 29 May 2009 (30 May: technical excursion), Florence

Meeting place: Bavarian Academy of Humanities and Sciences, Munich

Time schedule: Monday, 03. November 2008 – 12:30-18:00
Tuesday, 04. November 2008 – 09:00-14:00

Agenda

1. Opening
2. Minutes of the 47th TWG meeting in Helsinki
3. EUREF Permanent Network
   a) EPN real-time activities
   b) ITRF2008
   c) Densification of the ITRF2005
   d) EPN cumulative solution
   e) Report on EPN LAC Workshop
   f) Coordinates of EPN stations in national ETRS89 realizations
4. Update of ETRS89 memo
5. ETRS89 Working Group
6. ESEAS
7. AFREF
8. Preliminary results of the Italian Rete Dinamica Nazionale (RDN) of Istituto Geografico Militare Italiano and its alignment to ETRF2000 (R05)
9. EUREF campaign data base
10. EVRS2007 distribution of data and recommendations for EC
11. ECGN continuation
12. EUREF home page
13. Proceedings EUREF2006, EUREF2007, and EUREF2008
14. Divers:
    a) IAG2009
    b) INSPIRE
    c) GEOSS Architecture Workshop
    d) Wegener
    e) EuroGeographics
    f) EUREF-EUMETNET

g) European Railway Infradata Management: FP7 project SCO-OP

h) PLEGG

i) Second International Colloquium on Fundamental Aspects and Scientific Applications of Galileo and GNSS

15. Next TWG Meeting
16. Action Items

Participants

ZUHEIR ALTAMIMI, Paris
ELMAR BROCKMANN, Berne
CARINE BRUYNINX, Brussels (Chair)
ALESSANDRO CAPORALI, Padova
JAN DOUSA, Prague
RUI FERNANDES, Covilhã
HEINZ HABRICH, Frankfurt a.M.
HELMUT HORNIK, Munich (Sub-comm. Secretary)
ERICH GUBLER, Berne (hon. member)
JOHANNES IHDE, Frankfurt a.M. (Sub-comm. Chair)
AMBRUS KENYERES, Budapest
PEER KNUDSEN, Copenhagen
MARTIN LIDBERG, Gävle
JAAKKO MÄKINEN, Helsinki
RENZO MASEROLI, Florence (guest)
MARKKU POUTANEN, Helsinki
HERMANN SEEGER, Bad Neuenahr-Ahrweiler (hon. member)
WOLFGANG SÖHNE, Frankfurt a.M.
GÜNTER STANGL, Graz
JOAO AGRIA TORRES, Lisbon
MANUELA VASCONCELOS, Lisbon (guest)

apologized: WERNER GURTNER, Berne

Minutes

Remark: The presented papers and view graphs are published, as far as available, on the EUREF homepage (*http://www.euref.eu/TWG/EUREF%20TWG%20minutes/48-Munich2008/TWG-Munich2008.html*).

1. Opening

In her property as chairwoman of the EUREf Technical Working Group (TWG), C. BRUYNINX opens the 48th meeting of the TWG and welcomes the participants. She thanks the German Geodetic Commission for hosting this meeting.

2. Minutes of the 47th TWG meeting in Helsinki (all)

The minutes of the last TWG Meeting in Brussels, 17.06. 2008 were distributed among the TWG members. Some few corrections are to be attached. The final text is published in the EUREF homepage *<http://www.euref.eu/TWG/EUREF%20TWG%20minutes/47-Brussels2008/TWG-Brussels-minutes.pdf>*.

3. EUREF Permanent Network

a) EPN real-time activities

W. SÖHNE presents a report, the main topics are status RT in the EPN, IGS RT-PP – status and new activities. Since the last TWG meeting several new/updated RT data streams have been included into the EPN, further new features installed into the BNC (BKG Ntrip client) and BNS (BKG Ntrip service). According to the conclusions of the IGS workshop, additional proposals were submitted to the IGS Real Time-Pilot Project.

After the creation of the Special Project "EUREF-IP" in 2002, GNSS real-time data streaming has been successfully developed within EUREF. In 2007 the SP EUREF-IP has been changed into EPN routine operations. Currently 94 EPN stations are delivering regularly real-time data streams (49 GPS+GLONASS). It is recommended to undertake activities in order to improve the visibility of RT activities within EUREF. For that purpose, a new EPN Special Project on "Real-time Analysis" is created, chaired by W. SÖHNE. A new EPN RT webpage will be implemented within the EPN website and the Special Project will be announced via EUREF Mail.

In the discussion J. IHDE mentions that in global geodesy approaches to improve the supply of accurate and reliable data is rather important, hereby EUREF can contribute very well to this demand. Up to now the great majority of the work concerning real-time activities in EUREF was done by the BKG. W. SÖHNE invites all interested colleagues to join the project.

b) ITRF2008

Z. ALTAMIMI explains the plans for the upcoming computation of the ITRS2008. The strategy was discussed in detail with H. DREWES as director of the DGFI which works parallel with the IGN as computing centre for the ITRS. The strategy will be similar to that of the ITRF2005 computation. The input data consist of time series of observations comprising all available data derived from all relevant techniques. Corrections for geophysical fluid loading effects will not be applied.

c) Densification of the ITRF2005

A detailed paper on the *EUREF Regional Densification of ITRF2005* by H. HABRICH has been distributed before the TWG meeting. C. BRUYNINX gives a sketch of the activities up to now.

H. HABRICH then presents a series of viewgraphs on the topic *ITRF2005 Densification* for the European continent. Corresponding to the ITRF2005, the observations covering the weeks 860 to 1355 have been combined. Due to different datum definitions and inhomogeneous definitions of discontinuities, a combination of EPN and ITRF2005 was not carried out. The resulting coordinates and velocities are compared to the results computed within the frame of the former Time Series Project (TSP).

The TWG asks H. HABRICH to provide a new EPN cumulative solution tied to the ITRF2005 with minimal constraints. The solution should be distributed within one week after the TWG meeting, all TWG members are invited to validate this solution. The respective EPN cumulative solution (from the TSP and ACC solutions) which agrees best with ITRF 2005 will be chosen as the official EUREF ITRF2005 densification solution. The decision will be made before the end of November 2008.

d) Maintenance of the EPN ETRS89 coordinates

A. KENYERES then presents his viewgraphs to this topic. For testing the ETRS89 maintenance, a series of cumulative solutions has been computed. Concerning the EPN stations categorization, he proposes to introduce two categories of stations, depending on the length and quality of available data records. Similar to the categorization for EUREF campaigns, two categories should be introduced with a) 1 cm accuracy within the ETRS89 coordinates at any epoch, and b) 1 cm accuracy ETRS89 CRD at the mean epoch. The studies for the refinement of category separation and format specifications should be continued.

C. BRUYNINX mentions that all relevant information should be carefully presented in the website in order to help users to find the actual and relevant data and avoid misunderstandings.

The TWG asks A. KENYERES to continue the work and present his findings at the next TWG meeting.

e) Report on EPN LAC Workshop

A detailed report by H. HABRICH has been distributed by circular letter. The 6th EPN Local Analysis Centres Workshop was held on October 22-23, 2008 at the BGK in Frankfurt a.M. with 33 participants from 15 European countries. 10 LACs reported on their activities. The meeting was subdivided into 6 sessions, 24 oral presentations were given.

An intensive discussion referred the new re-processing of the EPN network back to its beginning. Several LACs confirmed to start the work. It was concluded that C. VÖLKSEN will take over the responsibility for the re-processing. The EPN-CB will set up a data centre dedicated to the reprocessing, it will contain an on-line copy of all EPN data since the start of the EPN. C. VÖLKSEN will report on his first experiences of the EPN re-processing and propose a draft for a new EPN initiative or Special Project on the reprocessing at the next TWG Meeting.

f) EPN in national ETRS89 realizations

E. BROCKMANN presents a proposal on the publication of official national ETRS89 coordinates adopted by the mapping agencies on the EPN web site. E. BROCKMANN remembers the EUREF main goal as the maintenance of the reference frame realized formerly mainly by campaigns, nowadays in particular by coordinates of permanent stations.

It is stated that the realization of this plan needs a long term initiative and highest reliability is essential. It is concluded that E. BROCKMANN together with J. IHDE will contact the national mapping agencies and compile the list of official ETRS89 coordinates for the EPN stations used by the mapping agencies in the different countries. The EPN CB will keep the list up to date and put the relevant information into the web. This initiative will need continuous efforts, E. BROCKMANN will report on the progress at the next TWG meeting.

4. Update of ETRS89 memo

An updated report *Memo: Specifications for reference frame fixing in the analysis of a EUREF GPS campaign* was distributed by circular, Z. ALTAMIMI explains the details. He remembers the various versions related to the respective ITRF solutions starting in 1992, the last one is Version 7 – 02-10-2008.

The TWG asks Z. ALTAMIMI to post the new version of the ETRS89 memo as soon as possible on the web site together with the list of ETRF2000(R05) coordinates and velocities.

5. ETRS89 Working Group

For this topic M. LIDBERG has circulated *A first draft towards a charter for a working group on future realization of ETRS89*. C. BRUYNINX remembers resolution 4 of the 2008 EUREF Symposium in Brussels which requests the optimization of future ETRS89 realisations with respect to stability, accuracy and consistency in order to meet the long

term requirements of high precision European geo-referencing. Therefore a clear documentation to lead the users is urgently needed. After several attempts in the past, M. LIDBERG has been asked to chair a new working group. Z. ALTAMIMI proposes to work out a detailed charter for the agenda, the adequate members can be engaged later. Moreover it is suggested to develop a system of rules for the ETRS according to the normalization after ISO standard in order to facilitate the access to the ETRS.

J. IHDE mentions that former statements and formulations should be considered, however, should not constrain new developments or restrict any new ideas. The EPN offers an enormous potential and is well estimated within the IAG. Thus the available possibilities should really be used for a broad use of the ETRS.

The TWG asks M. LIDBERG to prepare a more detailed charter of the new ETRS89 working group and iterate it among the TWG in order to propose a final charter at the next TWG meeting.

6. ESEAS

P. KNUDSEN has been invited to report on the European Sea Level Service (ESEAS) Project. Introducing P. KNUDSEN gives a sketch of the historical development of ESEAS. The work was initiated in 1996 with the establishment of the COST action 40 "EOSS". In 2001 ESEAS was started as a pilot project, 18 countries participated. In 2005 then ESEAS was established as a permanent service.

ESEAS is to be considered as the regional implementation of GLOSS (Global Sea Level Observing System), the main objective is to provide a standardized access to quality-assured sea level data and information in Europe to a broad range of scientific and non-scientific users. The data acquisition is based on national sea-level monitoring activities and data as well as quality-assured high-level products derived from the tide gauges, GPS and satellite altimetry.

The organisational main components of ESEAS are formed by the Governing Board, the Central Bureau, a Technical Committee and Working Groups. Besides the national representatives, corresponding members such as GLOSS, EUREF, EuroGOOS are part of the Governing Board. The members represent institutions for hydrography, oceanography and geodesy engaged in applicational services as well as in research disciplines.

As typical products ESEAS submits quality-assured sea level information to a broad range of users with hourly and monthly means of relative sea levels, historic and current rates of variations and long term trends and finally information on crustal vertical motions.

In the discussion C. BRUYNINX rises the question how ESEAS and EUREF can cooperate and support each other. It is proposed to centralize the computed time series in a central data base and make them available in the web. J. IHDE mentions that with this report the work and goals of ESEAS are much clearer now and expresses his hope for fruitful cooperation in future. Common interests for EUREF refer especially the EUVN and ECGN. The ECGN comprises about 60 stations with both levelling and EPN data records, many of them are connected to tide gauges, too. Considering the fact that the accuracy of the vertical component is not yet so accurate as the horizontal components, the data of ESEAS might help to improve the situation. H. HABRICH mentions that the start or re-processing the complete EPN data set offers a good chance to integrate ESEAS and offer special solutions for ESEAS as well. Thus the contacts are to be intensified for the benefit of all. Finally C. BRUYNINX offers to integrate ESEAS stations into the EPN and invites ESEAS to submit proposals and real data very soon.

7. AFREF

A status report on the African Reference Frame (AFREF) is presented by R. FERNANDES. AFREF is a common effort by the international community, in particular the African countries, to establish a continental reference system, consistent and homogeneous with the global reference system (ITRS) as a basis for the national reference networks.

At present the majority of national networks on the African continent are determined by classical triangulation with an astronomically-defined origin, their accuracy is mostly poor and does not fulfil the requests of modern societies. The planned AFREF will be based on the ITRS and realized by GNSS stations. Moreover an unified vertical datum as well as a precise African geoid are to be determined.

The practical installation of AFREF will surely need much assistance by the international community, besides the IAG also the UN, IGS, FIG and various other institutions give support. However, great emphasis is given to the demand that the network design, installation and operation of adequate stations and finally data analysis as well as the long term maintenance is carried out by the African countries as far as possible. Africa comprises about 60 independent territories of rather different area sizes. According to the plans every country should have at least one own station within AFREF.

In May 2008 a study case – AFREF08 – was carried out, 13 of the altogether 23 GNSS stations, being officially part of the IGS network, participated.

For the installation of AFREF the two major tectonic plates (Nubia and Somalia) plus some few minor tectonic blocks have to be taken into account. At the plate boundaries relative movements of 6-7 mm/y can be expected, thus the analysis for station coordinates and velocities have to be modelled carefully.

In the discussion to this report Z. ALTAMIMI emphasizes the need to convince the individual countries to integrate adequate stations into the IGS and enable generally access to their data which at present mostly are restricted.

8. Preliminary results of the Italian Rete Dinamica Nazionale (RDN) of Istituto Geografico Militare Italiano and its alignment to ETRF2000 (R05)

A report on the computation of the RDN was distributed by circular, A. CAPORALI explains the details. The presently used system IGM95 is referred to the ETRF89 at epoch 1996.0, the new RDN to ETRF 00 (R05) at epoch 2008.0.

The network comprises altogether 100 stations homogeneously distributed over the Italian territory with a mean inter-distance of 100 – 150 km. 14 sites are part of the ITRF 2005 and 27 of the EPN, 6 of them are located in neighbouring countries. The observation campaign was carried out from 23.12.2007 to 19.01.2008, thus 28 daily solutions could be computed. The data were processed by three analysis centres, i.e. IGM Florence, Padova and Como. The differences mostly are below 1 mm. The repeatability of the horizontal components ranges well below 10 mm, the same can be said for the vertical (except of station Palermo).

The TWG discusses the report intensively. The authors are asked to prepared a new version following the remarks of the TWG and to present the text to the next TWG meeting again.

9. EUREF campaign data base

At its last meeting the TWG concluded to recover the EUREF Campaign Data Base which has been unavailable for some time. Although the monitoring of the data base is rather time consuming, this information presents a worthful documentation on the development of EUREF and thus should be archived in a good way. Further many countries densify their networks, so the campaigns could serve in this aspect, too. Therefore a suitable map of campaigns should be installed and all information be stored on the EUREF website server. As the former organizer of the data base, H. V. D. MAREL, retired as TWG member, G. STANGL was asked to continue this work.

G. STANGL reports that this task could not yet be realized. In the discussion it is emphasized to follow this plan further on. Although now numerous permanent stations are operating and delivering good data records, the information of the former EUREF campaigns is considered to be worth to be preserved. The data can be used e.g. for regional densifications and thus double work be avoided. The TWG therefore asks G. STANGL to continue to set up the data base and report again at the next TWG meeting.

10. EVRS2007 distribution of data and recommendations for EC

Introducing J. IHDE remembers the history of the European vertical datum. As first attempts for a United European Leveling Network (UELN, REUN) the UELN 55and later the UELN 73/86 (gauge NAP) within Western Europe and the Uniform Precise Leveling Network (EPNN 76) of Eastern Europe (gauge Kronstadt) respectively are to be mentioned. On request of CERCO to establish an unified vertical datum for Europe at the 1-dm level, a first realization for the EVRF2000 was started on occasion of the EUREF-Symposium 1994 in Warsaw. While the EVRF2000 datum is referred to the NAP, the realization of the new EVRF2007 datum is based on 13 well selected datum points distributed over the stable part of Europe. The input data of the EVRF2007 are reduced to the zero tidal system and to the epoch 2000.

Resolution No.3 of the 2008 EUREF symposium in Brussels recommends the adoption of EVRF2007 as new realization of the European Vertical Reference System and to be proposed to the EC for adoption as the vertical reference for pan-European geo-information. At this symposium all the countries involved (except Bosnia/Herzegovina) agreed to exchange the data of the complete results (adjusted heights and coordinates) between all participating countries. These final results will be delivered in the next weeks to all countries (excluding the points of Bosnia/Herzegovina, this country will get only its own adjusted points). INSPIRE will be informed about these actions.

11. ECGN continuation

Introducing to this topic J. IHDE describes the structure and goals of the Global Geodetic Observing System (GGOS) as a presently main objective of the IAG. The European Combined Geodetic Network (ECGN) as an integrated European Reference System for Spatial Reference and Gravity is considered as a European contribution to the globally orientated GGOS. The ECGN project was approved at the business meeting of the International Gravity and Geoid Commission (IGGC) at the Gravity and Geoid 2002 Symposium in Thessaloniki as a cross-commission project. The primary concern of the project is to connect the height component with the gravity determinations with respect to data observed in coastal regions and above adjacent seas. Other objectives of the ECGN are:

- realization of a terrestrial reference system and maintenance of long time stability with an accuracy 10^{-9} for Europe especially in the vertical component,
- in-situ combination of space geodesy (GPS) with Earth gravity parameters (gravity, heights),
- modelling of influences of time depended parameters to TRF (of the solid Earth, of the Earth gravity field, the atmosphere, the oceans, the hydrosphere),
- modelling of terrestrial gravity field components to validate satellite gravity missions,
- geodetic platform within Europe for geo-initiatives (GMES, INSPIRE, GEOSS, GGOS).

As data from presently used techniques J. IHDE mentions VLBI, SLR, GNSS, DORIS, levelling, tide gauges, finally absolute -, superconducting - and spring gravimeters. Up to now geodetic networks observed by different techniques (reference frames, levelling, gravity) often are handled separately. A primary goal of the ECGN is to connect the observations of different techniques, to ascertain the quality, to take care of the continuation and stability of the infra-

structure and finally to guarantee the access to the data as well as the delivery of products to the end users.

J. IHDE emphasizes that a main challenge for geodesy is still to provide stable and well defined reference frames. Ignorance and unawareness of the need of stable and accurate geodetic networks is rather common, nevertheless reference frames represent a basis for numerous activities of the society in every civilized country.

It is concluded to forward the chairmanship for the ECGN within EUREF from J. IHDE to M. POUTANEN. M. POUTANEN states to form an adequate working group to activate the EVGN and to intensify the contacts to other groups working on comparable fields. As a first step an overview on the available / missing data should be elaborated in order to find a way how to proceed as efficiently as possible.

12. EUREF home page

M. VASCONCELOS presents a new front page, the TWG discusses the proposal. It is stated that the page should be more homogeneous and the buttons be on equivalent levels of importance. It is criticized that several sub-pages were not updated since years, so these have urgently to be reorganized or deleted if there is no actual information. C. BRUYNINX mentions that the handling and maintenance of the website is generally rather time consuming and thus the work hardly can be done by one person especially considering the fact that all engaged persons have other prior tasks. Therefore several colleagues should become responsible with specified tasks for updating and maintenance of the website. So J. TORRES is asked to care about the documentation part, H. HORNIK for the TWG part.

Concerning the list of projects presented on the front-page the EPN should keep an extra role due to its central importance for EUREF. It is also recommended to change the layout of the front-page not more than necessary in order to keep the memory effects of the users.

H. HORNIK, J. Ihde and M. VASCONCELOS are asked to prepare a new draft on-line structure of the EUREF web page following the elaborated proposals. The link should be provided to the TWG to get feedback and a final decision on the structure.

13. Proceedings EUREF2006, EUREF2007, and EUREF 2008

H. HORNIK informs that the proceedings volume of the 2006 EUREF Symposium in Riga just is in print and will be distributed in the next future. The volume of the 2007 Symposium in London is in print, too. J. IHDE declares that due to administrative reasons a time delay occurred, this problem will hopefully be solved in next future. A list of the already available / not yet available contributions of the last Symposium 2008 in Brussels is presented, it is urgently asked for a more fast publication of this volume. As already announced in Brussels, the editors of the new Italian Bulletin of Geodesy and Geomatics (BGG)[1] have offered to publish a selection of about 20 EUREF2008 papers in a Special Issue of the BGG. In contrast to former decisions, the German Federal Bundesamt für Kartographie und Geodäsie (BKG) will publish again a proceedings volume in its series including all available contributions, also those published in the BGG volume in full text.

14. Divers

a) IAG 2009

In his property as President of IAG Sub-Commission 1.3 "Reference Frames" J. TORRES invites to submit contributions on EUREF to the coming IAG Scientific Assembly, 31.8.-4.09.2009. The deadline for the submission is January 2009.

J. IHDE declares to compile a report concerning EUREF in general, the draft will be distributed among the TWG for comments, then the completed version will be sent to the LOC in Buenos Aires.

b) INSPIRE

J. TORRES informs on the new development in INSPIRE. As sub-parts being interesting for EUREF, the reference systems and grids are to be mentioned. Colleagues from ISO are also busy in INSPIRE. A first draft of specification including ETRS has been issued and is in the comment phase now. After November 2008 the updated text will be available for comments by the public. J. TORRES will report on the further progress at the next TWG meeting.

c) GEOSS Architecture Workshop

J. TORRES reports on the activities of GEOSS (Global Earth Observation System of Systems). He will participate at the workshop on 03.12.2008 in Valencia to give a presentation on IAS and reference frames.

d) WEGENER

The 14th General Assembly of WEGENER – WEGENER 2008 – took place from 15.-18.09.2008 in Darmstadt/ Germany. A paper *EUREF's Reference Networks EPN, UELN and ECGN – Basis for Tectonic Monitoring and Investigations in Europe* by J. IHDE, C. BRUYNINX, H. HABRICH, A. KENYERES, M. POUTANEN and M. SACHER has been submitted. WEGENER (Working Group of European Geoscientists for the Establishment of Networks for Earth science Research), already established in the beginning of the 1980s, originally was concentrated for the Mediterranean area, this areal restriction, however, has been dropped. J. IHDE informs that WEGENER is eager to intensify the cooperation with EUREF. From EUREF A. CAPORALI is nominated as official delegate. As conclusion for a future cooperation the following topics were formulated:

[1] Previously the *Bolletino di Geodesia è Szience Affini*

- EUREF is the key organization for the support of the geodetic GNSS ground based infra-structure in Europe – GNSS, Height and Gravity reference frames,
- EUREF invites WEGENER to join EUREF TWG Meetings for special items (and reverse),
- EUREF & WEGENER should think about common
  - initiatives in special regions (Mediterranean Sea – AFREF),
  - initiatives for geodetic infrastructures (FP7 Project PLEGG - Platform for European GNSS and other Geo-products),
  - scientific investigations of geodynamical features in Europe (recent crustal movements – vertical, horizontal),
  - contributions to environment and security in Europe.

e) EuroGeographics

J. IHDE remembers that the EuroGeographics Expert Group on Geodesy (EXG-G) has been closed in 2007. The co-operation with EuroGeographics, however, will be continued and intensifyed. EuroGeographics represents the community of the European NMAs and thus is an important partner for EUREF. The cooperation was documented by the memorandum of understanding signed at the 2007 EUREF Symposium in London (*http://www.euref-iag.net/documentation/OtherDocuments/MoU_EuroGeographics-EUREF_fin.pdf*). As future common activities J. IHDE mentions

- geodetic contribution to the implementation of INSPIRE in the frame of the Thematic Working Group CRS,
- implementation of the European Vertical Reference System (EVRS) 2007,
- development of CRS-EU information system to a on-line transformation service and registry for geodetic codes and parameters,
- implementation of GNSS real time components,
- preparation of the geodetic use of GALILEO.

Malta has requested support for a GNSS receiver. After the discussion of the application it arose that Malta does not need financial help but support by knowledge. On behalf of EuroGeographics the BKG will send personal to install two stations and to help at the beginning to operate the instruments.

f) EUREF-EUMETNET

E. BROCKMANN informs on the progress of the cooperation between EUREF and EUMETNET which was affirmed by the memorandum of understanding signed at the 2007 EUREF Symposium in London (*http://www.euref-iag.net/documentation/OtherDocuments/EUREF_EUMETNET_MoU.pdf*). The data exchange between the two communities works very well via a password-protected ftp server. Since April 2008 the usage of radio sonde data and since June 2008 synoptic observations for geodetic scientific use is offered. At the LAC Workshop in Frankfurt (cf. topic 3.e) some presentations on NRT processing for monitoring / meteorology have been submitted. Finally E. BROCKMANN mentions the E-GVAP GNSS expert meeting in Copenhagen on 06.11.2009 (*http://egvap.dmi.dk/workshop/1-introduction.pdf*), some colleagues of the TWG and EPN will attend the meeting.

g) European Railway Infradata Management: FP7 project SCO-OP

E. BROCKMANN remembers the contribution to this subject by T. ENGEL: *Developing Railway Geodesy* to the 2005 EUREF Symposium in Vienna (*http://www.euref-iag.net/symposia/2005Vienna/ExG-G-03.pdf* and EUREF Publication No. 15, p. 84-90). The new project SCOOP (Step towards COOrdinate driven data Processing) as a collaboration of railway companies to adapt ETRS89 for the track description and storage in the databases. FP-7 project was submitted in Sept. 2008, up to now France, Germany and Switzerland are participating. The goal is to transform the enormous data bases into a commonly usable system especially adapted to the requirements of international railway traffic.

h) PLEGG

The report on PLEGG (Platform of European GNSS Geo-products) by C. BRUYNINX is included in topic 14.d.

i) Second International Colloquium on Fundamental Aspects and Scientific Applications of Galileo and GNSS

The notes on an organization meeting held in Padova on 20.10.2008 have been distributed by circular, A. CAPORALI gives some comments. The conference will be held in Padova, too, from 14.-16.10. 2009. The principal organizer of the conference is ESA with support by other institutions (URSI, IGS, BdL, COSPAR). The time schedule for the conference was fixed and a Science Opportunity Document with J. F. MINSTER as Chief Editor set up.

15. Next TWG Meeting

A. KENYERES invites the TWG to hold its Spring 2009 Meeting in Budapest from 26.-27.02, noon to noon. relating information will be send out in time.

16. Action items

A draft of the action items will be distributed by H. HORNIK in the next days, the comments worked in and the final version distributed again.