

Time & location:

Tuesday, October 24, 2017, 09:00-18:15

Royal Observatory of Belgium, Ringlaan 3, 1180 Brussels

Room: Meridien

MINUTES**1. Opening (Kenyeres)**

The GB chair AK thanks ROB for the invitation to the GB meeting and the Analysis Center workshop and welcomes the members of the GB, especially the new members MS, JL and CV.

2. Approval of minutes of 74th TWG meeting in Wroclaw (Söhne, all)

The minutes of the last meeting are approved without changes. The EUREF secretary will send them to the EUREF webmaster for publication on the EUREF web page.

3. Review of Action Items from previous TWG meetings (Söhne)

The EUREF secretary WS reviews the Action Items of the last meeting. All topics are done, or in progress, and on the agenda of this meeting.

4. EUREF**a. Maintenance of list of official national representatives and “EUREF member” organizations (Söhne, Poutanen)**

EUREF has to maintain a list of the official national representatives and update the list if necessary. Such a list is not available from the EUREF web page – in contradiction to the EPN where a page “Contributors” exists with all participating agencies etc. with one to three representatives for each.

WS received from the IAG secretary general, Hermann Drewes, the list of IAG council delegates from Europe. This list is updated each year, but changes between the dates are likely. These members are appointed by the countries to IUGG. 32 European countries are listed, but not all countries which are regularly contributing to EUREF are present. Only a very small number of the listed representatives is actively participating to EUREF activities. So this list is not well suited. The GB agrees on writing a letter to each national committee¹. This letter should include the names of participants of the country of past meetings. In addition, these participants should be informed about the coming letter.

AI1 to AK, MP, and WS: formulate and write a letter to the national committees about the nomination of at least two national members for EUREF with voting rights. Inform the participants of former EUREF symposia about the letter in due time.

b. Access to EUREF web page (Söhne)

On the possible implementation of a password-protected area on the EUREF web page, WS presents four proposals for discussion: i) same structure as the “open” GB pages but with additional hyperlinks for download of files; ii) simple listing of the contributions on one download page with a logical naming of the files; iii) directory structure with one subdirectory for each meeting; iv) leave it as it is but for each file which should be protected the user is asked for a user:password combination. Manuela Vasconcelos is investigating on this topic together with her IT section. The GB is in favour of a simple solution, e.g. via dropbox. Some members have concern on the security problems of this solution. Are there other options available with some more security, e.g. google docx? Investigations need to be continued.

¹ See <http://www.iugg.org/members/adhering.php>

c. **EUREF trademark**

Mid of July, MP received a notice from China that a company would like to register www.euref.cn. EUREF's reply said that one cannot prevent this, moreover, in that special case no confusion is to be expected. Because other prominent web names like www.euref.de or www.euref.org are already occupied, there were again some thoughts about a trademark or similar for the label EUREF. Did the situation with pros and cons change in the last years? The GB concludes that there is no need for further actions from EUREF side.

d. **Opening Address on occasion of the first GB meeting (Poutanen)**

The GB chair briefly recalls some issues of the past which led to some atmospheric disturbances within the board and expresses his hope of a return to regulatory work in a friendly atmosphere. Afterwards, the EUREF chair MP gives a speech on the occasion of the first meeting under the new name where he briefly recalls the ambivalent feedback he and others received at the last symposium. He also emphasizes the need for a result-oriented work. In the following discussion all speakers underline their willingness and expectation for friendly cooperation. AK emphasizes the importance of good compromises during the decision-making process and the non-diverse communication of the GB members to the community. ZA refers to the "Robert's Rules of Order"² which are used within the IAG.

e. **On the Implementation of a Strategy Group (Poutanen)**

MP proposes the implementation of a group or a working group for preparing the future EUREF strategy. He emphasizes that a strategy plan or paper should be ready to be presented and discussed at the next symposium. The GB is not in favour of implementing a Working Group or similar before the goals of such a group are specified in more detail. WS proposes that each GB member could deliver a list of up to five bullet points with her/his important topics for EUREF within the next years, worth to be included in a EUREF strategy plan or paper. The GB agreed upon this.

AI2a to all: formulate up to five key points about strategic issues for EUREF and send them to WS and MP by end of November.

AI2b to WS: compile a full set of proposals and distribute it to the GB before Christmas.

AI2c to MP: formulate a first draft for a EUREF strategy plan, based on the proposals, for the next GB meeting.

f. **EUREF Publication series (Technical Notes) (all)**

On the occasion of the update of the "Memo" (see below), ZA is proposing a new publication series for EUREF named "Technical Notes" (TNs). Moreover, he is proposing the first two issues of the new volume: TN 1: Relationship and Transformation between ITRS and ETRS89, and TN 2: Densification by Bruyninx et al (2013, to be updated). WS complains about the general weaknesses of the EUREF publications, online as well as printed. Before starting a new series some strategy is needed for continuation of such a series. Some members are not in favour of introducing a new terminology unless it is clear which documents will be published in this new series and in which way, e.g. printed, with isbn or DOI number, online. RP asks if guidelines should be published or if there is a difference between technical notes and guidelines. Discussion whether the guidelines could be published as TNs as some of these are documents which are regularly updated. The discussion reveals that there are differences in the understanding of the

² See for example https://en.wikipedia.org/wiki/Robert%27s_Rules_of_Order

wording “technical note”. WS raises the question on continuation of the EUREF publication series, which was stopped with number 17 published in 2009. AC asks about the procedure to publish. Can everyone ask for publication? Is there a review process? Will the GB decide? Finally, the topic is postponed and the decision was taken at Agenda Item #8.

5. Working Groups

a. WG on EPN Densification (Kenyeres)

AK highlights the progress of the densification, namely the new contributions coming from the Nordic countries and from Turkey, where a letter to Turkish representatives concerning their willingness to contribute to the EPN densification had been written. AC asks about the homogeneity of the contributions of the Densification Analysis Centres (DACs), for example concerning processing guidelines. AK replies that certain key parameters are very likely fulfilled by the DACs with one exception of Bulgaria. AC emphasizes the differences between velocity and deformation, which should be used more carefully within the GB and the Densification WG.

AK informs about the planned European Ground Motion Service (EU-GMS) activities. The service plans the regular monitoring of the surface height changes using satellite radar interferometry over the territory of countries participation in Copernicus program. A white paper was prepared and sent around by Michaela Frei from BGR³ on September, 14 with (short) deadline on September 21. AK reviewed and commented on behalf of the GB. Main contributions or references to EUREF, GNSS and/or geo-referencing in the white paper are on pages 9/10: Level 2b products (“EUREF network for geo-referencing”) and page 21: short description of EUREF. The final version of the white paper was sent to the EU commission, the Copernicus User Forum and the Copernicus User Committee September 25.⁴ It was also distributed to the GB for information on October 10. AK expresses the need to follow the EU-GMS actions and promote EPN and EPN Densification products due to the mutual interest and coherence on the product level. ZA formulates some concerns about the possible contribution from EUREF to EU-GMS, if a Call for Tender for the operational service is going out and commercial companies are going to bid. EUREF as a whole is not able to participate to such commercial activities.

b. WG on Deformation Models (Lidberg)

ML reviews shortly the main tasks of the WG. He mentions the meeting of the IAG WG 1.3.2 Deformation models for reference frames in Kobe. AC asks for details on modelling, e.g. around earthquakes. ZA asks for models to be made available. Method of collocation to start with. Next steps: AK will provide the actual EPN Densification velocities to the WG to facilitate the start of the analysis and velocity field modelling. AK asks for the potential input of the Velocity WG. ML replies that results of the WG can be used in addition if more or other stations were available.

6. EUREF Permanent Network

a. New EPN multi-year solution expressed in IGS14 (Legrand)

JL presents her results for a new ITRF2014/IGS14 densification solution based on the daily combined EPN position solutions. She replaced EPN-repro2 by routine

³ Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover, Germany

⁴ Follow-up to the GB meeting, on October 25 M. Frei informed that the Copernicus User Forum decided on October 13, 2017, to recommend the EU-GMS / GMSDE for immediate realization in Copernicus.

solutions for full 2014 due to problems. Differences or improvements to the previous approach are for example post-seismic deformation (PSD) modelling and annual/semi-annual signal estimation. It seems that the routine solutions are less noisy than EPN-repro2. The time series of the transformation parameters between the individual input daily SINEXs and the cumulative SINEX output of the combination show a jump in Tz when switching to epn14.atx and a change in the behaviour when switching from EPN-repro2 to routine (mainly visible in the scale). This can be explained by the fact that routine and EPN-repro2 have differences in the strategy (routine is based on a combination of almost one software, while EPN-repro2 was based on a combination of three different software packages) and in the applied modelling (atmospheric tidal loading, tropospheric mapping function). After that, she compares the new EPN multi-year solution with other solutions. The agreement with IGS14 is good. The largest velocity differences can be explained by different observation periods or different discontinuity handling (e.g. Brussels), except in Greenland. Despite of the very good agreement with IGS14, the larger differences in Greenland and Nordic stations make the choice of reference stations more difficult and make the reference frame alignment weak. She shows position and velocity differences between new EPN and last C1934. After the lunch break, JL continued with the investigations about the switch from epn_08.atx to epn_14.atx. The correction of the positions based on IGS input was insufficient for some of the stations. For these 18 stations, the remaining jumps have been handled by introducing a discontinuity at 029/2017. Investigations about jumps from EPN-repro2 to routine processing (week 1773) showed +6 to -8 mm coordinate changes. As example for position and velocity discontinuities stations TRO1 and BRUS are discussed. JL proposes a new scheme for categorization of the EPN stations. The new definition for Class B based on sigma/threshold avoids to move station to Class A with too short available observation time span. This new definition still needs some improvement and the classification for C1950 will be based on both objective and qualitative criteria. Former stations in Class A? – Yes, with some redefinition of Class A. Agreement on publication of C1950 with further improvements for next C1965. JL asks which ETRS89 frame to be used for publication. GB replied ETRF2000 and ETRF2014. The solution C1950 and the following ones will be available in IGS14, ETRF2000 and ETRF2014. GB encourages JL to write a Technical Note on the occasion of the new EPN solution. JL agrees but she would like to finish her tests before.

b. Report of the Troposphere Coordinator (Pacione)

RP presents results of the investigations concerning existence and download of RINEX meteo files. Beginning of August, Carey Noll sent an excel file with statistics about CDDIS.

WS added some numbers about the meteo files collected at, and downloaded from, BKG data centre. EUREF mail 9168 to the station managers has been sent out quite recently. RP shows that there is a bug in the RINEX meteo file definition on the height H in the RINEX meteo header and in the RINEX 2.11 header (remove WGS-84). Is there a feedback about the usage of these files, beyond the download? JD mentions that there is only very limited use of these files, for example possible use of the in-situ files for cross-checking of Numerical Weather Models. Finally, RP reports about the progress of the new SINEX TRO 2.0 format and the usage of long filenames.

AI3a RP and JD: check if there are methods for monitoring the quality of the meteo files.

AI3b to WS: contact some frequent users of meteo files for some feedback.

c. New EPN AC and review of AC guidelines (Liwosz, Pacione)

TL as ACC informs about the new EPN Analysis Centre BEV. The OLG AC stopped its operations and the responsibilities have been taken over by BEV. After testing the BEV coordinate and troposphere solutions for several weeks, ACC and troposphere coordinator started including the BEV individual solution into official coordinate and troposphere solutions, starting week 1963. The ACC expressed his special thanks to Günter Stangl for his long-term commitment for operating the OLG AC. The second topic deals with troposphere modelling which is different for the AC. Some are still using GMF, the recommendation should be the switch to VMF1. The ACC will provide the necessary options for the download via http since ftp from Vienna is not possible. In case of missing external information a switch back to GMF should be used. It is also mentioned that two ACs are still not providing horizontal gradients and they will be advised to start providing this information as well.

AI4 to TL and RP: contact the two ACs not providing horizontal gradients to urge them to include these gradients into their solutions.

7. EUREF contribution to EPOS: EPOS data supplier letter and data policy (Bruyninx)

CB discusses the EPOS supplier letter as a crucial factor for EUREF's contribution to EPOS. She distributed in advance (Oct. 10, by the secretary) the letter as well as the general EPOS data policy. WS is asking why the Annex of the letter should be also signed separately. CB replies that this could be changed if agreed in EPOS.

WS explains that he discussed the data supplier letter with BKG's lawyer as well as the technical staff. The lawyer did not see any obstacles to not sign the letter. The only requirements given are about the quality and the formulation is vague enough. The technical staff of BKG emphasizes that a participation of BKG must not lead to additional personal effort and additional effort concerning the content of the data since there will not be additional means to be expected from the participation. CB explains that, apart from signing the commitment letter, no additional effort is expected from station managers.

CB emphasizes that the supplier letter under discussion is only for the EPN data, not the products. ML raises the question of CC:BY license and doi assignment. AC notes that his administration told him its concern about the wording "commercially". AK called the attention of the GB members and all GNSS data providers to the possibility to attribute doi (digital object identifier) for the RINEX data they are providing. This may facilitate to get higher visibility of their contribution and facilitate referring to the data provider by the users. For example, GFZ, Germany, is an organization, which has expertise in doi attribution. It is agreed that the EPN CB will contact the EPN operational centres (OC) to invite them to sign the EPOS data supplier letter. By doing so, the EPN OC will give EPOS the permission to also distribute their EPN data.

8. Relationship and Transformation between ITRS and ETRS89 (Altamimi)

ZA sent out well in advance to this meeting the proposed update of the "memo". In fact, it is a thorough revision. Main message of the new version are the new parameters for the transformation from ITRF2014 to ETRF2000 and ETRF2014. He proposes to set the translation parameters (and the scale) between ITRF2014 and ETRF2014 to zero. WS prepared an excel sheet with the questions and remarks on the proposed memo and the answers by ZA.

Discussion between AC and ZA about stable part of Europe and the sense of such a definition today. AK proposes to put a clear definition of the "stable part" - e.g. in terms of velocity uncertainty threshold – in the final version. The document, proposed as a "Technical Note" (TN, see above) should be readable as standalone document for not so much experienced user. Several members emphasize that numerical examples, with interim results, would be very useful for the understanding of the procedures. AK raises the question whether EUREF should think about a new definition of ETRS89 in the future. Finally, the GB agrees on the release of the paper as TN1.

AI5 to ZA: update the TN following the discussion of today and the comments received.

9. Upcoming tasks and decisions regarding EVRS (Sacher)

MS reports about the upcoming tasks and decisions regarding the EVRS. She starts with a description of new or updated data, e.g., Russia, Germany, Switzerland, and with an overview about further expected data, e.g. Italy, Belgium, and Czech Republic. After using the tunnel measurement for the computation of a constant offset between ODN heights and EVRF heights, no more tilt will impair the Great Britain results. She continues with the presentation of a new uplift model for the Nordic countries (NKG2016LU_lev), which differs especially in the area of Russia from the former model (NKG_2005LU) and where the affected area is extended to the south for the first time. She proposes to reduce also the Swiss data to a common epoch. MS discusses a new EVRF, which could be finalized until the end of 2018. A preliminary solution could be presented at the next symposium. She raises the questions what should be the height system in the next release: zero tide, mean tide? ZA refers to the IERS convention. He asks for the users of the realization. MP asks for the connection or relation to the world height system.

10. EUREF symposium 2018 (Huisman)

LH explains the status of the symposium. Meanwhile, date and venue are fixed and communicated via relevant portals. Moreover, a first save-the-date EUREF mail was sent out, announcing the – already existing – web page. Places are almost fixed and presented to the GB. LH proposes a tutorial about InSAR, mainly organized by TU Delft. GB agreed on this. The tutorial is foreseen as a full day event on Tuesday. Exact date of the GB meeting has to be confirmed since some members announced their interest in participating to the tutorial. Concerning the symposium's programme, WS emphasises that the GB should at an early stage identify mandatory talks and should allocate slots in the preliminary schedule, independently from submitted abstracts. The GB as a whole should discuss about invited talks; leaving it to the individual sessions chairs was not very successful in the past. LH proposes to split the session on National Reports into two parts, optimally spread over two days. Discussion about the session titles: should the session structure be kept the same as it was for the last two years or changed? The majority seems to be in favour to keep the sessions as is. GB agrees that the sessions must be fixed and communicated before the next GB meeting, by end of January.

AI6 to all: provide ideas for the session structure of the next symposium by end of November.

11. Action Items (Söhne, Kenyeres)

12. AOB

a. FIG congress in Istanbul, 06-11 May 2018 (Lidberg)

The GB agrees upon the proposal of ML to participate with a talk on behalf of EUREF on the European terrestrial reference systems.

b. Next GB meeting(s) (all)

AC invites the GB to Padua for the spring meeting. As date for the noon-to-noon meeting is February 27-28, 2018 proposed. The secretary should announce date and venue to the excused members asap.

AI7 to WS: announce proposed venue and date for the next GB meeting to all GB members.

c. EUREF symposium 2019 (Poutanen)

MP announces that a letter from the Estonian Land Board arrived where they announce their willingness to host the over next EUREF symposium. The GB unanimously welcomes the proposal.

PARTICIPANTS

Z. Altamimi (ZA)
E. Brockmann excused
C. Bruyninx (CB)
A. Caporali (AC)
R. Dach excused
J. Dousa (JD)
R. Fernandes excused
A. Kenyeres (AK)
J. Legrand (JL)
M. Lidberg (ML)
T. Liwosz (TL)
R. Pacione (RP)
M. Poutanen (MP)
M. Sacher (MS)
W. Söhne (WS)
G. Stangl excused
J. Torres excused
C. Völksen (CV)

A. Araszkiewicz (AA)
L. Huisman (LH)
P. Mitterschiffthaler (PM)