

Time & location:

Monday, May, 28, 2018, 13:00-18:00, Kadaster, Naritaweg 3, 1043 BP Amsterdam

Tuesday, May, 29, 2018, 08:30-12:30, Double Tree by Hilton, Oosterdoksstraat 4, 1011 DK Amsterdam

MINUTES**1. Opening (Kenyeres)**

AK welcomes the participants and the guests and thanks the Netherlands Kadaster for the invitation.

2. Approval of minutes of 76th GB meeting in Padova and of both Webex meetings (Soehne, all)

The secretary sent out the final version on May, 16, together with the minutes of both webex meetings. Some last minute changes by CV received to the webex 2 minutes. The final version will be forwarded to the EUREF Webmaster for publication, Only the minutes of the Padova meeting will be put on the EUREF web page.

3. Review of Action Items from previous GB and Webex meetings (Soehne)

The EUREF secretary reviews the action items from last GB meeting as well as from both webex meetings. Most of them are done, in progress and/or on agenda. However, some action items were not touched so far and they should be renewed:

Action Item GB76/2 on Agenda Item 5a to RP, JD, ML, CB/JL: Start investigations on PPP with respect to its usage for reference frame realisation in EUREF. Report on the next or over next GB meeting.

Action Item GB76/6 on Agenda Item 9 to TL: The ACC is asked to organize a test campaign, where the global approach can be investigated in detail, to prepare a working paper with pros and cons concerning "EPN going global?" and to ask the ACs whether they are willing to contribute.

Action Item to MP: Write a letter to the German company Geo++ to emphasize the deep interest of EUREF in calibrating GNSS ground antennas for new constellations, in particular Galileo, and new signals/frequencies, in particular E5/L5.

4. EUREF Symposium**a. 2018 (Huisman, Woudt)**

LH and RdW review the most recent status of the symposium, the programme and the social events. The GB agrees on the last minutes changes of the program.

b. 2018 Resolutions and Resolution Committee (all)

One resolution has been already proposed prior to this meeting, on gravity and height (see below). Two other resolutions are clear, the one on the Slovenian GNSS campaign and the acknowledgement to the local organisers. CB proposes one resolution on the DOI issue. AK proposes one resolution on the strategic plan. RD proposes a resolution on antenna calibration, in particular for Galileo. As usual, Mark Greaves will lead the resolution committee and he will make an announcement during the opening session asking for contributions from audience.

c. 2019 – 2021 (Poutanen, Soehne)

Place and date of the next symposium are already fixed with Tallinn in Estonia to be held May 22 to 24, 2019. The GB discusses the session structure and the session conveners for the next symposium. WS mentions that it is too late to start with the discussion during the fall meeting; it should be picked up during the summer season. MP adds that some new young colleagues could be motivated. CB proposes to share the National Report session with PosKEN. This is a proposal

to EUREF from the PosKEN meeting in April (see agenda item 10).

There is proposal from Slovenia for hosting the symposium next or over next year. Also Italy is considering a proposal for one of the next years. WS points to the fact that EGU in 2020 will be in May, not in April, which could affect the date for our symposium.

5. EUREF Strategy

a. EUREF Governance (Poutanen)

The GB discusses the excel sheet (re-ordered version from AK) on proposals concerning the strategy of EUREF. WS proposes to revive the “tradition” on inviting guest on specific topics. JT agrees. MP mentions the UN-GGIM:Europe topic; there is a meeting in Brussels next week where he is participating. ZA is not in favour of mixing technical and political actions. A discussion follows about possible publications under the EUREF label. No solution on this. Next, a discussion on the GB follows, especially on the composition of the GB. CB emphasizes that everything is written down in the ToR but obviously, they are not applied consistently. We need to start the revision of the membership including the selection/appointment of new young and motivated EUREF fellows. The GB discusses again the detail of the two national delegates. Writing a formal letter to the national committees is still an open issue.

Action Item to WS: Complete the list of addressees and finalize the letter to the national committees.

Action Item to WS: Send the list of GB members with background information to the GB.

b. Towards an EPN Master Plan on Analysis Centre Structure (Webex 1 Action Item 1) (Liwosz, Bruyninx, Kenyeres, Legrand, Lidberg, Pacione)

TL summarizes the communication in the group during the last weeks. He presents some results from the combination which have the main disadvantage of contributing different number of ACs to the different phases, e.g. in repro2 vs. operational. Moreover, the number of contributions using the three different software packages in use is highly unequal (BSW -14, GAMIT -1, GIPSY-OASIS -1). The proposed solution is based on a two-phase combination: first the individual solutions from each software package are combined, then those three are integrated. Obviously, this is currently affecting the BSW contributions only. The proposal is to motivate more ACs using GAMIT or GIPSY, (3 to 4 AC for each software for redundancy. From the discussion, it is clarified that non-EPN ACs and other software packages may also be involved. RP is not in favour of the proposed scheme for different reasons. The old GIPSY-OASIS version is not supported anymore and there is a new version GipsyX to be expected with a new license fee. Moreover, the workload for processing the complete EPN is not an easy task. She proposes a set of “super sites”, e.g. IGS[YY] sites, used by all contributors. (Continuation on next day)

ZA asks the ACC for the balance, the weighting of the three different solutions and to clarify his strategy. RF is in doubt towards the balance and mentions a GIPSY-X course in September for potential candidates. EB says that a rigorous combination of all solutions instead of pre-combination should give identical results, with correct weighting of course. WS is in doubt that many ACs were able to switch to another software. He is proposing to check another (extreme) option without GIPSY and GAMIT. CV mentions the high costs for a GIPSY-X license. Moreover, he is not in favour of skipping softwares. The GB agrees. JD says that the GB needs a general agreement on the diversity first before going into discussion how to reach this. ML points to the upcoming analysis within EPOS where two ACs will process the whole network. CB agrees and adds the view on

the densification ACs and other organisations in Europe. WS is in doubt that the discussion is too much on residuals and clean time series and does not consider the “inclusive” aspect of the EUREF community. Some members do not share this (pessimistic) view. Finally, the GB agrees on increasing the diversity of the software packages used within the EPN and, if necessary, to open the contribution to other organisations in Europe. The discussion continues looking again to the pros and cons of “EPN going global”. Finally, the Action Item to TL on a test campaign with global network is renewed (see above).

c. Gravity & Height (Webex 2) (Poutanen, Sacher)

MP reviews the second webex meeting on height and gravity and presents a draft for a resolution on this topic. MP is in doubt that gravity data will be fully open in the near future. There are different kinds of gravity data – relative, absolute, superconducting – with very different levels of publication. In many, but not all, countries the NMAs are responsible for the gravity data. AK raises the question to install a working group on this. The GB in general agrees on the resolution, which should be refined in the resolution committee.

d. Complementing height expertise in the GB (Soehne)

(skipped)

e. Towards an Implementation Plan (all)

Action Item to MP, AK, Lennard Huisman, and JT: Based on the discussion of today, prepare, on one page, a strategic plan for EUREF to be discussed on the next GB meeting.

6. Campaigns

a. Slovenia 2016 GNSS Campaign (Action Item 3) (Berk, Medved)

SB presents again the report of the processing and the analysis of the 2016 Slovenia GNSS Campaign. A subset of the campaign was used for the EUREF densification of ETRS89 in Slovenia. Results are coordinates in 2016.75 epoch. ZA asks some additional questions concerning, e.g. velocity and adopted velocity model. MP asks about the multipath behaviour of some the stations. Finally, the campaign is accepted by the GB as Class B.

b. Short note on EUREF campaigns (Soehne)

At the last GB meeting in Padova, the secretary received a USB stick from the former DFC, G. Stangl with campaign documents etc. (approx. 1700 files), The content starts with 2009. All documents etc. on hard disk were lost at OLG. WS asks how to proceed with the campaigns. The existing web page at the EPN CB is frozen at the status of 2011 because of not or not fully established interfaces and the unclear situation with the campaigns in general. Moreover, all links to OLG are not working anymore. WS complains the lack of visibility of the campaigns which is not nice for the engaged national colleagues asking for validation and he proposes, as minimal solution, to add the final reports of the campaigns as the “paper version” to the oral presentations given at the symposia – only after the formal approval of the campaign by symposium’s resolution, of course. AK also mentions the data and the submitted coordinates. JT is proposing some additional information for older campaigns.

Action Item to JT, WS and Manuela Vasconcelos: sample what is available about the GNSS campaigns and provide an as simple as possible presentation form for the EUREF web page.

7. Guidelines

a. EUREF Analysis (Liwosz)

TL presents the update of the AC guidelines. The update is necessary due to changed options and changed combination strategy. He shows rms differences and residuals for individual stations. The GB discusses about the clear visibility of the Galileo impact because of the other effects (mapping function change, software change at MUT). RD asks for the residuals with and without Galileo. ZA concludes from the presentation that adding Galileo seems to degrade the solution, at least before GPS week 1980. So it is questionable to add Galileo as a recommendation in the guidelines at this early stage. EB mentions also the GLONASS effect, which is still underestimated. He also mentions the intersystem translation parameters. CB asks what has changed since the last AC workshop where it was recommended to not include Galileo. There is a proposal for a recommendation for a resolution on Galileo issues. RP asks for the situation in the IGS. RD replies that the MGEX project is still outside (parallel to) the legacy product. A discussion follows about the point when each AC may introduce Galileo. Is it better that all switch at one time or is it better when each AC is switching depending on his experience? RD points to the fact that impact of changes to, e.g. VMF is bigger than with or without Galileo. EB is in favor for an EPN LAC mail rather than a resolution. CB asks what is happening to our future 3G processing if the IGS decides to add Galileo calibrations to the type mean calibration.

Action Item to TL: update again the guidelines according to the discussion of today and prepare final version for the EPN web page

b. EUREF Densifications (Action Item 1) (Lidberg, Caporali, Dach, Legrand, Zurutuza)

ML summarizes the discussion on the guidelines. The PPP part is postponed, so the minimum constraint (MC) part is discussed. The background to this discussion was described in a ppt distributed to the AI1 members in advance. There it is pointed out that the Guidelines could be made more precise as to the timewise stacking of campaign solutions and the alignment of the velocities to Class A sites. The tests were based on Minimum Constraints on Velocities and compared the case where three velocity translations are estimated with the case where no velocity parameter is estimated and the cumulative solution of the EPN is added to the stack. The analysis shows that both options give comparable results, in the sense that the recovered velocities of class A sites are well within a standard deviation from their nominal values. The study points out that the preferred option is to include the cumulative solution in the stack rather than solving for velocity translations (or rotations or both). The motivation is that in this way the 'dense solution' fully embodies the variance covariance structure of the cumulative solution of the EPN. By contrast, the solved for velocity parameters in the other approach are difficult to interpret and probably reflect numerical deficiencies. The study concludes that both options in the use of Minimum Constraints on Velocities (solve for velocity translations or combine with the most recent EPN cumulative solution) may be recommended in the Guidelines, with preference for the second option. During the discussion, it was concluded that the reason of this issue is that they applied MC on positions only, but fixed the velocities at EPN class_A stations (probably this is a misunderstanding). The GB proposes that ZA and JZ may sit together and discuss the specific problem. JZ may reproduce his solutions for comparison with JL's solutions. Questions are the level of details within the guidelines and to be as neutral as possible, e.g. not to recommend a specific software. ZA recommends simplifying the guidelines, to remove the explanation of MC and to let the users do with the respective software manuals. CB and JL are in doubt that the change of the guidelines was

that simple.

8. Working Groups

a. Multi-GNSS WG (Brockmann)

EB mentions the invited talk on Multi-GNSS within the symposium and the resolution which will be prepared by RD for the closing session. CV asks for the inclusion of Beidou in the software packages but this seems to be too early.

b. Reprocessing WG (Voelksen)

No news to be discussed.

c. WG on EPN Densification: EPN Densification – where to go (Kenyeres)

AK goes through his presentation for the symposium. He presents a first velocity field for Europe based on the 3000+ stations and on his solution named D1933, as an input for the WG on Deformation Models. The next release should be D2000. AA asks for the velocity product: will it be based on raw, filtered or gridded velocities? EB asks for the availability of the results. AK replies that this will be later this year, after an – almost finalized – publication.

d. WG on Dense Velocity Fields (Brockmann)

EB shows a summary of the presentation to be given at the symposium. Roughly, 25 % stations have redundancy making cross validation of individual inputs possible. There will be a splinter meeting of the working group during the symposium. A discussion follows about the way to compare the results of both working groups. CV reminds to the proposal of a strain rate map and asks for the unique selling point of the EPN and how to present our results on the EUREF web page for more visibility. ZA asks for the potential users of our products. WS recalls last year's symposium where it was visible that to independent solutions within two different working groups exist and he asks how to overcome this for this year. ML encourages the GB to use both results, at least as the basis for his working group on deformation models.

e. WG on Deformation Models (Lidberg)

ML reviews his presentation on Thursday. He mentions the contributions he has received up to now, from both working groups as well as one from EPOS. He and his colleagues at LM are working much on methodology and he mentions examples, or working areas, for the Nordic countries as well as for Italy and Greece, which is more part of EPOS. MP mentions again the dynamic reference frames as the future in Europe.

9. Towards a new EVRS Realization (Sacher)

MS recalls the new data available or announced since the last symposium. She shows differences between the current and the preliminary new realisation. There a major differences w.r.t. UK. A short discussion follows on the tidal model used. It is concluded that EVRS according to its definition is a zero tidal system and that the new realization should follow its definition. Nevertheless, it is planned to provide a solution in the mean tide system in addition. The GB agrees on the proposed deadlines and the questionnaire to the contributing countries concerning the publication of the data / results, which MS will present at the end of her symposium's talk.

10. External Interfaces: EuroGeographics PosKEN (Bruyninx)

There was a meeting in Brussels on April, 26+27. CB and EB attended, also some other colleagues from the EUREF community, either physically or by webinar. On behalf of the EUREF GB, CB gave a presentation about EUREF.

11. General Data Protection Regulation (GDPR) (Torres, Bruyninx)

JT gives a short introduction into the topic. The regulation is in place since two years but the important date was last Friday (May 25, 2018). The GDPR are going to be mandatory directly for all EU citizens, companies and organisations. He mentions the "basic considerations" of the regulation, especially no. 156 about public interest. He also mentions the "definitions", e.g. no. 26 on "international organisation". There are different reactions on the GDPR, from requesting renewal of consent over simple information on updating the data policy to additional information about withdrawal. JT proposes one person observing the issues related to GDPR. EUREF is affected in several ways, e.g. file headers, cookies etc. CB explains what the EPN CB has been done in the last weeks. Prior to the meeting there was some email exchange between various people discussing the impact to the EPN and the EUREF web page as well as other entities, e.g. the data centres. ROB lawyer propose to sign a kind of contract, in the broadest sense. Anonymous or not? ROB started with description what is on a public ftp area or not. CB is explicitly pointing to the re-publication of downloaded, publicly available data, e.g. site logs. ML asks what for example is with the GB members, which are on the EUREF web page. EB mentions some other documents, e.g. the minutes of GB meetings, especially the history.

Action Item to all: consider to find a volunteer within the GB to observe the issues related to the GDPR.

12. AOB

- a. **DOI: example (Webex 1 Action Item 2) (Bruyninx)**
(postponed to the next meeting due to time restriction)
- b. **REFAG 2018**
MP promises to send out a draft of the presentation he is preparing and to ask for contributions, with clear deadline.
Action Item to MP, all: send draft presentation to the GB members; GM members to participate with contributions.
- c. **Next GB meeting(s) (all)**
MP invites to Finland. However, first is to check with other meetings in October and November (EPOS, IGS workshop, ICG, EUPOS).
Action Item to MP: check possible dates and conflicts with other meetings, prepare a doodle, if necessary.
- d. **Action Items (Kenyeres, Soehne)**
As usual, AK und WS will compile the full set of action items together with the draft minutes of the meeting within the next two weeks.

PARTICIPANTS

Z. Altamimi
 E. Brockmann
 C. Bruyninx
 A. Caporali excused
 R. Dach (day 1)
 J. Dousa
 R. Fernandes
 A. Kenyeres
 J. Legrand
 M. Lidberg
 T. Liwosz
 R. Pacione
 M. Poutanen
 M. Sacher

W. Söhne
J. Torres
C. Völksen

A. Araszkiewicz
S. Berk (day 1)
L. Huisman (day 1)
K. Medved (day 1)
P. Mitterschiffthaler
R. de Woudt (day 1)
J. Zurutuza