

Time & location:

Tuesday, October 15, 2019, 0830 – 1820

Pl. Politechniki 1, 00-661 Warsaw

Warsaw University of Technology; main building (room 123 on the first floor)

MINUTES

Last update: October 16, 2019

1. Opening (Söhne)

The GB chair WS opens the meeting.

2. Welcome (local organizers)

On behalf of the LOC TL welcomes the GB members and guests; organisational matters.

3. Approval of minutes of 80th GB meeting in Tallinn (Söhne, Kollo)

- 4. WS displays the minutes from last GB meeting in Tallinn. There were no more comments on the minutes, so they are ready for publication on the EUREF web page; minutes to be send to Helena Ribero who publishes them on the EUREF web page.*

Action item to KK: Distribute the information about the change of the EUREF webmaster to the GB members

Review of Action Items from previous GB meetings (Söhne)

Most of the Action Items of last meeting were done, are in progress or on the agenda.

Discussion on Action Item 1: WS testing some tool for German government. CV gives overview: Google, OneCloud, Dropbox – convenient, cheap, limited storage, support for Word documents, but there is no guarantee that the data are stored on European servers under EU law, therefore the usage is generally prohibited for EU governmental organisation. Alternatives by Deutsches ForschungsNetz (DFN); it provides a communication network on national level. For example “LRZ sync and share”, provided by the local computing facility in Munich, is an alternative; accessed by a web browser, one user can share documents, write access is limited – this might be intermediate solution. Portuguese solution is not working so well, but documents for all community shall be stored on one EUREF server. “SharePoint” could also be an option (but as it is a Windows product, it might be questionable). CV proposes to continue the investigations on the topic.

Action Item for CV: continue the investigations on establishing a permanent exchange. First contact Helena Ribeiro about options on the EUREF Webmaster’s side.

5. EVRF2019 (Sacher)

MS reports on the new developments on the European Vertical Reference Frame. Last version was computed in March, reported in last symposia. New border connections from Austria, in particular to Slovenia and Italy, new connection from Slovenia to Italy, new data from Bulgaria, and first time data from North Macedonia were delivered after the symposia. The last data were delivered in August. Bulgaria has large differences, one datum point in Romania deleted to have consistent solution.

Questionnaire – no changes w.r.t. the symposium, most countries agreed to publish data online except Belarus, Ukraine, Russia – mutual data exchange, Bosnia-Hercegovina no answer, so no data published. ML has contacts to them, will provide it to MS.

Data to be published in EVRS web page, by the end of the year. Final report to be published by the end of October. Discussion on the missing countries – Albania, Greece, Moldova, Serbia.

KM informs about a meeting on geoid computation held one month ago in

Bosnia&Hercegovina. Preparations for high-precision levelling made in Serbia, Montenegro has not started the levelling activities.

6. EUREF symposium 2020 (Berk, Medved)

Date of symposium in Ljubljana is 27-29 May 2020, half day tutorial 26 May, in cooperation with geodetic Institute of Slovenia, University of Ljubljana. Symposium will be held in Intercontinental Hotel. Two small meeting rooms available, e.g. for splinter. Tutorial will be in Faculty (capacity is 70 persons), same building as GB meeting. Symposium Dinner in the castle (capacity is limited to 120 people), guided tour in Ljubljana before the dinner. Icebreaker at the same building as Symposium (top of the building with nice view over Ljubljana).

Registration fee 250 euro, tutorial 40 euro, accompanying persons 125 euro, late registration 290 euro, deadline for registration and abstract is 24 April. GB meeting is 25 to 26 May, noon-to-noon. On Wednesday poster session + splinter meetings are possible.

Tutorial: Quality management of data and products of active GNSS networks, first part – Legal issues and relations, second part – Quality and monitoring; third part – Role of GNSS networks as basis of national reference systems (Scandinavia, Greece?). GB proposes some more geographical coverage of the speakers. CV proposes open data policy as additional topic in the first session of the tutorial. Web page ready by the end of the year, should be published within January 2020.

Discussion on possible change of program, sessions. Should be discussed within GB meeting 83 (May 2020).

7. EPN

a. Antenna calibration for Galileo signals – conclusions for the EPN (Dach)

RD gives a detailed overview on the scale issue. GPS and GLONASS calibrations available, for Galileo pre-launch calibrations: no L5 calibration instead calibration from GPS L2 are used for L5. Chamber vs robot calibration difference around 1 mm for the PCV, no clear evidence which calibration method is better one. Chamber vs robot calibration (Galileo) – mean diff ~-5 mm for position – systematic error if using GPS instead of Galileo, in global solution a bias of 1 cm occurs for Galileo; if GPS L2 is used for Galileo E5 – diff 0; therefore it seems to work. General conclusion: Do not use a system if no calibrations are available! Proposals: (1) Stick to GPS + GLONASS; (2) extent GPS + GLONASS + Galileo IGS/EPN.14atx; (3) switch to IGS14r3.atx (i.e. the file prepared for upcoming IGS repro 3). It is emphasized that MGEX is experimental and so are its products; rather do not use it, but use CODE rapid products, which are of very high quality. Refer to EUREF-mail No 2492. The GB concludes to leave the decision for one of the options to the AC workshop.

b. Update of the "Guidelines for EPN Stations and Operational Centres" (Bruyninx)

No comments submitted beforehand. CB introduces several changes: RINEX 2 submission optional if RINEX 3 is submitted, update of several links, submission of RTCM 3 preferred above RTCM 2, removing summary files, clarification on coordinates used in real-time streams, inclusion of description of Multiple Signal Messages (MSM) types.

All comments given during the presentation (e.g. small change in section 2.4.1, removal of section 3.2.7 (former section 3.2.5)) are taken into account, guidelines shall be published in November on the EPN web-page. CB also mentions that there is a first proposed EPN station from Montenegro, with the first Chinese made receiver type in the EPN.

Action Item to CB: distribute the final version of the guidelines within the GB and publish the updated guidelines on the EPN web page

c. EPN station classification (Legrand)

JL reviews the new classification scheme. Currently, Class A and class B stations are available, with no velocity for class B. New classification: Class C0-C5, + some more. Position and velocity solution – web page developed by JL, for reference station selection, possibility to check the time series, you can export list, and make your own list for computations. Help to select reference stations for positions only and positions + velocity, criteria can be refined, development– additional outputs, what are needs for users? In the future – no A and B solutions, instead positions + velocity > 3 years, short list < 3 years positions only. Guidelines for EUREF densifications: changes needed in sections 2, 3.2, 5, 7.1 and 7.2.

The tool for selection of reference station is available from http://epncb.oma.be/_productsservices/RFC/index.php. The link for the table with all the criteria of the stations:

http://epncb.oma.be/_productsservices/RFC/table.php

Comments by GB: (1) AC: What kind of feedback from users is expected? JL: for example if anything is missing; (2) EB: where is the difference, seems to be roughly the same? JL: The idea of the tool is to help user to select the ref stations. (3) CB: the procedure is same – user has to extract needed information. (4) AK – user needs more training. (5) JL – provide ASCII file with classification? (6) How to automatically generate the necessary files from the output provided – make API. (7) Create a good short list for high quality stations which can be used as ref stations. (8) WS – tool is understandable, what kind file we get as the result? What is the difference between old A and B and new two files? (9) One file for all stations with position and velocity, even station has below 3 years observation? (10) One file for all stations and separate files for classes C0-C5? (11) How long observation time is necessary before reliable position and/or velocity information becomes available, 15 weeks window now for EPN cumulative solution?

Action item to all: GB members check and test to tool with the link given in the minutes and provide feedback to JL

8. Coordinators

No presentations given

9. Working Groups

a. EPND WG: product validation and preparations for D2050 (Kenyeres)

Processing of D1933 was completed last year, the paper was finally published in GPS solutions on 4th of October.

<https://link.springer.com/content/pdf/10.1007%2Fs10291-019-0902-7.pdf>

Continuation for D2050, network extension (Iceland, Romania (processed by SGO), Germany?). Some testing tools developed by JZ. Preparation for EPN densification as EUREF product. Web-page is under preparation, goal is to have new solution twice per year. There will be a jump from D1933 to D2050. With more than two years of additional observations the improvement is visible, e.g. in Italy. AK proposes the EPN Densification as an operational product. Should be finally declared at the next symposium.

Discussion: (1) AC: do there exist other solutions, how do they differ? How could it be ensured if the guidelines are applied 100 %? – AK: Not possible. Guidelines are

applied, to his best knowledge. Need for external comparisons, e.g. crosscheck of common stations, velocity estimation not only with CATREF. Antenna PCVs for example could also be checked. (2) CB: we can have an official product once per year, but do we need the routine product (there is not one now). (3) AK: mentions DOI again, for RINEX up to SINEX. Should be discussed at the workshop. (4) AC and EB doubt that we are really on the stage for an official product.

Action Item to AK: report on the correct usage of the guidelines, explain possible validation of the product, in particular the velocities, make D2050 densification solution available

b. Different methodologies in EPN Densification (Zurutuza)

JZ introduces a test on combining AC-wise NEQs (positions and velocities). Compared with weekly-wise combination as done now. So far, 7 individual contributions are available. He introduces his own discontinuity file for this study. A web-page is available: <http://147.162.183.197/EPNDMY>

Action Item to all: check the web-page provided by JZ for his multi-year study and give feedback

10. InSAR-Geodesy Study Group (Lidberg, Kenyeres)

ML recalls the short history of InSAR in EUREF as well as the background. InSAR topics presented in Wroclaw and Amsterdam, EUREF-mail on purchasing active transponders, initiative within Copernicus on European Ground Motion Service (EU-GMS), EPN densified products with GNSS time series. EU-GMS is in the progress of defining products, allocate IT etc. In particular with the Sentinel satellites there is a need for geodetic support. Goal to provide seamless products on large areas, what geodetic infrastructure is needed to tie InSAR and GNSS together? Another request is for a medium-dense velocity field for Europe.

Discussion on Memorandum of Understanding on the topic, and then to have formal discussion. RP: atmospheric part is common in InSAR and GNSS, but the resolution is different, to provide ZTD from EPN stations, it is available now. AC asks for persistent scatterers. CV mentions the German example where Federal Office for Geosciences and Natural Resources (BGR) is more interested in SAPOS velocities due to its higher density than the EPN. MP mentions the Finland case of establishing so-called superstations with collocated geophysical equipment.

InSAR-Geodesy study group – why to do something, but to increase the awareness. MP: is there a real benefit for our purposes/applications?

WS: we need a clearer picture if installation of InSAR is needed, some products which we can offer, we have not been successful to show our products during the EU-GMS meetings.

AK: EU-GMS as a project will be established, they form a consortium, install boards, will prepare some products, after the call, to be launched by EU_GMS. Next year, we can have contacts, we should not only give but also get something (added value for EUREF), for example height reference.

The GB concludes that is too early to take any actions today¹.

11. EUREF

a. Strategy (Lidberg, Poutanen)

ML shortly recalls the latest version of the strategy. There wasn't a new version distributed for today. He asks the GB to give some directions how and where to go

¹ A vertical deformation service is in preparation and will be online in the end of 2019.

with the strategy, like: do we need to keep its current structure or do we need to reduce or extent the contents. But it needs to be improved.

Discussion: 1) Gravity – contacts and interested feedback. 2) ECGN – shall it be mentioned? 3) Connections to WHS, dynamic reference frames, standardization. 4) What is the purpose of the strategy, and to whom we are going to present it (the GB, the plenary, a non-concrete group)? 5) Too detailed is not recommended; 6) splitting the strategy into a strategic plan and an implementation plan.

Action Item to RD: get in contact with the IGS Central Bureau to get an example for strategic plan and implementation plan

Action Item to ML: update the EUREF strategy by applying separation into strategic plan and implementation plan

b. (S)Election of GB members 2020 (Söhne)

WS introduces possible new positions: Outreach coordinator, Gravity and geoid modelling, Densification coordinator, InSAR related activities, Deformation models, Real-time expert.

Discussion: 1) did EUREF mail 09789 from 22 March 2019 already includes a call for new GB members? No, was only for EUREF chair. Nevertheless, potential candidates were disappointed; 2) ToR – membership possible again after one period? 3) Is it necessary that each GB member has to be responsible for a dedicated part of the EUREF work? 4) Describe in the strategy that geoid modelling is needed! To promote gravity activities, organize an invited talk by a specialist! The GB concludes that a call for experts should be communicated via EUREF mail (end of February at the latest).

Action Item to WS and CB: prepare detailed descriptions for open positions for outreach expert and GNSS expert, distribute to GB members prior to next GB meeting

12. AOB

a. EU PSI directive (Bruyninx)

Postponed to the next meeting due to limited time.

b. Next GB meeting

CV announces to host the next GB meeting in February in Munich, Wolfgang bakes a cake.

Action Item to CV: set up a doodle (or similar) with possible dates for GB meeting 82

c. Review of Action Items (Söhne, Kollo)

KK and WS will distribute the draft minutes of this meeting including the Action Items asap.

PARTICIPANTS

- Z. Altamimi (excused)
- E. Brockmann (EB)
- C. Bruyninx (CB)
- A. Caporali (AC)
- R. Dach (RD)
- A. Kenyeres (AK)

K. Kollo (KK)
J. Legrand (JL)
M. Lidberg (ML)
T. Liwosz (TL)
R. Pacione (RP)
M. Poutanen (MP)
M. Sacher (MS)
W. Söhne (WS)
J. Torres (excused)
C. Völksen (CV)

A. Araszkievicz (AA)
S. Berk (SB)
K. Medved (KM)
J. Zurutuza (JZ)