

**Time & location:**

Two online meetings November 09 and November 19 1300 to 1500 CET

**MINUTES****1. Opening (Söhne)**

*WS opens meeting.*

**2. Approval of minutes of 83<sup>th</sup> GB online meeting (Kollo, Söhne)**

*Minutes sent last week, if there are any corrections please sent to WS and KK.*

**3. Review of Action Items from previous GB meetings (Söhne, Kollo)**

*InSAR: WG established. Maybe Ramon Hansson can participate in the next GB meeting? AK shares happiness of the establishment of such a WG*

*GSSC: GB should observe GSSC activities. CB: no contacts from GSSC, not clear what kind of collaboration is meant. WS: not in our side, wait them to contact.*

*EPN densification: letters to collaborations sent, feedback positive*

*WS: memberships of EUREF and (alternative) election procedures.*

*JL: official letter from Latvia to GB needed. No news from Latvia so far.*

**4. EUREF symposium 2021 (Medved, Berk (gov.si))**

*KM shortly summarizes the three options. MS and others are in favor of option C followed by option B. ZA ask the local organisers to follow as long as possible all three options. Option A seems to be too risky in particular with respect to the costs. GB members are asked to comment until the second meeting if they have other aspects to consider.*

**5. EVRS and Height****a. News on EVRF2019 (Sacher)**

*MS explains the bug introduced to the EVRF2019. A sign error in the transformation of geopotential differences from non-tidal to zero-tidal system. Error caused tilt effect of the adjusted EVRF heights of Poland (magnitude 23 mm NS direction). Mainly the Baltic States and Poland are affected. August 27 new solution provided, September 07 EVRS data in website updated. Transformation grids as well updated.*

**b. On the height unification in Europe (Joachim Schwabe (BKG))**

*JS: most countries have implemented EVRS-compatible heights. Proposal for the new WG "Unified height reference surface". National reference grids, geoid models (in IGS repository), EUVN-DA action, no official height reference surface product. Actions would include: collect, update and provide information about current official national height reference frames and products, e.g. geoid models, transformation grids and their metadata, etc. In general, the GB agrees with the proposal. JS is asked to refine the concept and to ask volunteers to contribute to the group. From the GB, AK, MS and ML should be members.*

**6. EPN****a. Changing compression (Söhne)**

*IGS changes the compression for incoming RINEX files. There was an IGS mail no.7970 from 24-SEP-2020*

*(<https://lists.igs.org/pipermail/igsmail/2020/007966.html>) announcing the change from compressed files (\*.Z) to zipped files (\*.gz), starting from November*

01 on. It is postponed to 9<sup>th</sup> of December. Currently, there was not an announcement to the EPN station providers so far. On the other hand, the EPN CB and both EPN Data Centres would like to be in line with the IGS. The EPN DCs seem to be in the position to change the compression scheme.

**Action Item to WS: contact Markus Bradke and ask for more details on how the IGS DCs are planning to go ahead.**

## 7. EUREF Governance

### a. GB membership (Söhne)

Three GB members left the GB 2019 and 2020. Plan to recruit two new members and, therefore, a EUREF mail (10170 from 04-MAR-2020, 10188 23-MAR-2020 as reminder) with a description of two positions, GNSS expert and Promotion&Outreach expert was distributed. For the second position, no feedback received. Discussion on different options how to continue: a) reopen the call for positions again in February 2021 as EUREF mail for the same two positions, b) reopen the call for positions again in February 2021 as EUREF mail for two positions but change the second one where no feedback received, c) reopen the call for positions again in February 2021 as EUREF mail only for the second position and freeze the first one to the received feedback, d) do online elections at the symposium, with all registered listeners as voting members, e) do online elections, with one voting member each country, f) postpone elections until the next face-to-face at a EUREF symposium, g) skip elections at all and search for members for the specific tasks the GB identifies. CV is asked for new formulation for candidate (document shall be sent before GB next part on 18<sup>th</sup> of November).

### b. EUREF Strategy (Lidberg)

ML and AC have developed a draft EUREF scientific plan and sent it to the GB members this morning. Only a short discussion on general aspects is started at the end of the first meeting due to time constraints.

### c. Contractual arrangements for EUREF contributors (Söhne)

WS: request by email from BEV on a possible contractual arrangement of the work or obligations done by BEV for EUREF. One proposal was to sign a MoU, but the colleagues from BEV didn't think that this was enough for the heads of BEV. One important argument is, that EUREF is not a legal entity and, therefore, doesn't have the means to sign such a contract. BEV mentioned, that IUGG is registered in Denmark and, therefore, seems to be a legal entity and that EUREF as a sub-commission of the IUGG member IAG could be understood as part of the legal entity.

Another option would be that the organization of the acting EUREF chair could sign such contracts, but this seems to be very difficult if not impossible on European level (e.g., applying Danish law?).

WS points to the risk that, if one organization starts with such a formal procedure, other EUREF contributors may follow.

Discussion during the meeting: AC: BEV should contact IUGG if they need such a contract. ML: that is correct, but finally EUREF is involved in any case. Is a formal legal body necessary? There will be more such questions in the future, think for example on UN-GGIM. WS: will call BEV colleagues next week and inform GB on the result. RD: how are the IAG entities working? They are replying to a call and to contribute. MP: agrees to talk to the BEV colleagues first. ML as EUREF chair could sign a MoU but not a contract. CB: call it collaboration agreement instead

of MoU.

**Action Item to WS: contact BEV to discuss different options and inform the GB about the result.**

**d. EUREF – EPOS MoU (Lidberg)**

*EUREF, in particular EPN components or entities or organisations, are either deeply involved in EPOS TCS “GNSS”, e.g. M3G by ROB or the deformation modelling by LM, or are part of the Services, e.g. weekly combined product by WUT, densification network by Lechner/FOMI, EUREF data centres by BKG and ROB. It should be discussed in the GB, if a MoU is needed, between which partners it should be signed, what is the minimum content, etc.*

*ML shortly reviews the motivation, why a Memorandum of Understanding between EUREF and EPOS should be considered. AC asks for the background that a MoU is a give and take, what is the value added for EUREF from EPOS could be? ML sees many common interests between both partners, from dense networks to deformation modelling.*

**Action Item to ML: distribute the draft MoU between EUREF and EPOS to the GB members**

**e. EUREF season’s greetings (Söhne)**

*In a pre-meeting email, WS proposes to write a kind of extended EUREF seasons’ greetings before Christmas. Since the annual symposium as the most important occasion to get in touch with the EUREF community did not take place, it would be a good occasion that the EUREF Governing Board could inform the community in a concise way. The contributors could also recall some links to the various web pages instead of attachments.*

*CB agrees to the idea and proposes a kind of newsletter. MS proposes to use the attendee’s list of the 2019 symposium for distribution. In case of a newsletter it may contain also figures and it could be prepared for download from our web pages.*

**Action Item to WS: start a template for a EUREF GB newsletter and send it to the GB members asap**

**8. Coordinators**

**a. Analysis Center Coordinator (Liwosz)**

*TL presents the progress of the combination, in particular the updates in the ASI contribution with GipsyX. CV asks RP concerning stopping fixed ambiguities in GipsyX with multi-GNSS. RD: should be possible, should be investigated. RP: possible for GPS, but the other systems, not sure.*

**Action Item to RP and RD: investigate possibility to fix ambiguities for multi-GNSS in GipsyX**

**b. Troposphere Coordinator (Pacione)**

*RP presents the progress in the troposphere product, in particular the conversion to IWV. EPN IWV has been evaluated against NGL IWV estimates for 1year period and 270 EPN stations. Few estimates get negative ZWD, physically not possible, In case it happens IWV will be set equal to -999.000 in TRO SINEX. From the table, AC identifies a possible correlation between the numbers of outliers and the station height being the max of 1.2% for ESCO (at ~ 2500 m altitude) but RP explains that there are many stations with high altitude, which don’t show such problems. RP is using as auxiliary data (pressure and weighed mean temperature of the atmosphere) necessary for the conversion ECMWF operational products provided by TU Wien*

**c. Reference Frame Coordinator (Legrand)**

*JL shows some slides for new C2115 solution based on IGb14, replacing IGS14. The overall agreement is quite good, although there are some differences when switching to IGb14. Some of them could be explained by short observation time spans, a few, e.g. REYK may need some more investigation.*

**9. Working Groups**

**a. WG on Dense Velocities (Brockmann)**

*EB shows the progress of the WG on dense velocities, in particular new input, e.g. PPP solution from Kreemer et al. for western part of Central Europe and updated models from NKG. He informs also about the OGC working group on deformation models, e.g., on the questionnaire sent out mid of September.*

**b. EPND WG (Kenyeres)**

*AK presents the new web pages for the EPN Densification, prepared and hosted by his organization. At first, the link should be sent to the contributors for comments, then to the GB and finally should be published before end of this year.*

**c. Combination of regional solutions – update (Zurutuza)**

*JZ shows the progress in the comparison of week-wise versus AC-wise combination. More solutions could be used thanks to the letter, AK had sent out to the contributors of the EPN Densification. Both approaches have pros and cons and JZ cannot finally decide, which solution is better and concludes that both should be used as complementary solutions.*

**d. WG on Modeling (Rebekka Steffen (LM))**

*RS shows results of the work done at LM using the collocation method for deriving a gridded velocity field, for example Poland, Hungary, and Latvia. WS asks for the inclusion of EB's dense velocities solution, which is much denser now for Germany. AK is not convinced that the Nevada solution might have a big positive impact. AC: asks for the correlation length, which may be valid for smooth regions. One should be careful with regions with small velocities.*

**e. Multi-GNSS WG: Putting precise ephemeris into a broadcast form (Caporali, Zurutuza)**

*Due to the limited time, AC can only outline the motivation for his analyses and the potential of putting precise ephemerides into a broadcast form.*

**10. AOB**

**a. Next GB meeting(s) (Kollo)**

*The GB agrees on the proposal by WS and ML to set up a third GB meeting, which should cover the EUREF Governance activities, in particular on EUREF strategy.  
**Action Item to KK: set up a doodle to find a date for a follow-up GB meeting***

**PARTICIPANTS**

Z. Altamimi      excused for 2<sup>nd</sup> part  
 E. Brockmann  
 C. Bruyninx  
 A. Caporali  
 R. Dach

A. Kenyeres  
K. Kollo           excused for 2<sup>nd</sup> part  
J. Legrand  
M. Lidberg  
T. Liwosz  
R. Pacione  
M. Poutanen  
M. Sacher  
W. Söhne  
J. Torres  
C. Völksen

A. Araszkievicz  
S. Berk  
K. Medved  
J. Schwabe       only 1<sup>st</sup> part  
R. Steffen       only 2<sup>nd</sup> part  
J. Zurutuza