

EUREF TWG meeting: March 21,2013 13:00 – March 22, 2013 12 :00

Location: *Meridian meeting room of the Royal Observatory of Belgium , Avenue Circulaire 3, B-1180 Brussels, Belgium (more details at <http://www.epncb.oma.be/organisation/twg/2013/>)*

DRAFT AGENDA

Last update: 21.03.2013

1. Opening (Bruyninx)
2. Approval of minutes of 60th TWG meeting in Berne (all)
3. Review of Action Items of 60th TWG meeting in Berne (all)
4. Next EUREF symposium in Budapest
 - a. Organisational aspects (Kenyeres).
 - b. Scientific program (Ihde, Caporali).
 - c. Best students / young scientists presentation award (Ihde).
5. WG on deformation models (Lidberg, presented by Bruyninx).
6. INSPIRE (Poutanen).
7. EUREF promotion and outreach (Poutanen, Söhne)
8. Multi-GNSS WG
 - a. General (Brockmann et al.)
 - b. G-Nut software development (Dousa).
9. Role of permanent positions / coordinators, Review of ToR (Ihde et al.)
10. EPN
 - a. BSW5.2 in EPN processing (Brockmann, Dach).
 - b. EPN Densification (Kenyeres)
 - c. CEGRN EPN combination (Caporali):
 - d. Real-time analysis SP (Söhne)
 - e. Next EPN LAC workshop (Bruyninx, Söhne).
 - f. EPN ACC successor (Ihde et al.).
11. Divers
 - a. Status web publication papers EUREF 2012 (and before) (Caporali).
 - b. EPN-REPRO1 paper (Habrich, Völksen).
 - c. COST GNSS4SWEC action (Dousa).
 - d. EPOS update (Fernandes).
 - e. Russian reference frame sub-commission (Ihde).
 - f. EUREF paper IAG Scientific Assembly (Potsdam, deadline: 21-April-2013) (all).
 - g. ITRF2013 (Altamimi).
12. Next meetings
13. Action Items (all)

Participants**TWG members:**

Z. Altamimi
E. Brockmann
C. Bruyninx
A. Caporali
R. Dach
J. Dousa
R. Fernandes
H. Habrich excused
J. Ihde
A. Kenyeres
M. Lidberg excused
R. Pacione
M. Poutanen
W. Söhne
G. Stangl
J. Torres excused

Guests:

D. Lovell excused

Minutes

1. Opening (Bruyninx)

In her property as chairwoman of the EUREF Technical Working Group (TWG), C. BRUYNINX opens the 61th meeting of the EUREF TWG, welcomes the participants and expresses her thanks to the Director of the Royal Observatory of Belgium for the invitation and organization of this meeting. On behalf of the Royal Belgian Observatory, C. BRUYNINX welcomes the TWG and submits her best wishes for a successful meeting. A draft of the agenda has been distributed among the TWG. The participants accept the agenda after some minor corrections.

2. Approval of minutes of 60th TWG meeting in Berne (all)

The minutes of the 60th TWG Meeting in Bern/Wabern 13-14.11.2013, were distributed among the TWG members. The final text is published in the EUREF homepage.

3. Review of Action Items of 60th TWG meeting in Berne (all)

AI1: EB/RD should investigate how the Multi-GNSS Working Group can contribute to the routine EPN monitoring tasks performed by the EPN CB. Deadline: next TWG. *On Agenda*

AI2: CB will check possible date/locations for a new EPN LAC analysis workshop in 2013 (it should have been normally in 2012). Deadline: end 2012. *Done*.

AI3: AK to contact JULIETTE LEGRAND for convention on virtual DOMES used within IAG WG on the Integration of dense velocity fields in the ITRF. *Pending*.

AI4: AK/JI will propose a new letter, to distribute to NMCAs, to DAVE LOVELL. Deadline: End of Nov. 2012. *Pending*.

AI5: RD will provide to WS the method to take into account the scale difference between ITRF2008 and ETRF2000 through a correction of the real-time IGS08 clocks. Deadline: ASAP. *On Agenda*.

AI6: CB will distribute the link about the updated real-time analysis web pages to the TWG. TWG members should review the web pages. Once this is done, CB will add the EPN real-time orbits&clocks to the EPN CB as a new EPN product. Deadline: end of Nov. 2012. *Partly done*.

AI7: ML will distribute the updated WG charter among TWG Members, who will propose final corrections. Deadline: Dec; 1, 2012. *Done*.

AI8: AC will check how ORFEUS is working as a legal entity. Deadline: next TWG. *Done*

AI9: CB will contact OLEG KHODA to inquire about situation. After that JI will reply to HERMANN DREWES. Deadline: ASAP. *Done, on Agenda*.

AI10: JI will look into the possibility of publishing contributions of TWG to previous EUREF Symposia on CD. Deadline: ASAP. Possibility for one printed version. CD copy can be done for selected papers. *Done*.

AI11: JI to contact HELMUT HORNIK and ask for all papers from previous Symposia missing on EUREF web site. AC to put these papers on EUREF web site. Deadline: ASAP. *Pending*.

AI12: JI propose titles + session chairs for EUREF Symposium in Budapest to CB. Deadline: end of Nov. 2012. *Done*.

AI13: Session chairs (TBD) propose session description to AK to be published on Symposium web site; Deadline: end of Dec. 2012. *Done*.

AI14: AK prepare Symposium web site. Deadline: Jan. 2012. *Done*.

AI15: JI/CB to submit an abstract for IAG. Deadline: March, 2013. *Not yet done, deadline April 2013*.

AI16: CB to invite DAVE LOVELL to next TWG. *Done*.

AI17: CB to invite GUY WÖPPELMANN to next TWG. *Done, unable to attend*.

4. Next EUREF symposium in Budapest

a. Organisational aspects

(Kenyeres).

Location is finalized in the Ministry of Rural Development. Overall program and social programs are defined. It is mentioned that current hotel capacities and prices may significantly deviate from those given in the WEB description.

b. Scientific program (Ihde, Caporali).

Invited speakers to be contacted by the session chairs. It is advisable to remind the EUREF community to submit papers /abstracts within the deadline of April 16.

c. Best students / young scientists presentation award (Ihde).

Carl Calvert is able to support the award but unable to be present. Poster or paper, student or young scientist: all this needs to be finalized.

5. WG on deformation models (Lidberg, presented by Bruyninx).

Since November 2012 the number of data sets has increased to 60. An inventory of velocities has been prepared, although not all in the same frame. Talk scheduled at EGU session G6.2/GD1.6 Geodynamics of Eurasia: The Contribution of the Geodetic Community to EPOS, Friday, 12 Apr, 14:45-15:00

6. INSPIRE (Poutanen).

Recommendations on EVRS are made by Lidberg within the activity of the Thematic Working Group on Land Elevation. More specifically, it is important to ask the National INSPIRE Representatives for support of the following amendments of Recommendation 16 and particularly Recommendation 17, in the document [INSPIRE Reference: D2.8.II_v3.0\(.3\) TWG-EL Data Specification on Elevation 2013-02-04 Page 73:](#)

Recommendation 16. When available, the national realizations of EVRS should be used, and when such national realization

is not available the EVRF2007 realization of EVRS should be adopted as height vertical reference for pan-European geo-information in areas within the geographical scope of EVRS

Recommendation 17. For areas that are outside the geographical scope of ETRS89, it is recommended to derive gravity related heights based on positions in recent ITRF, presented as heights above the GRS80 ellipsoid, corrected for the geoid height using a well specified geoid model based on EGM2008 (or on a future follow up version of EGM2008).

NOTE: The EGM2008 by itself does not define the geoid or a height system. A number of additional decisions and constraints on parameters are required in order to define a geoid model from the EGM2008 potential coefficients. For the achieved height value to be reasonable well defined, the used EGM2008 based geoid model must be carefully specified.

7. EUREF promotion and outreach (Poutanen, Söhne)

The argument originates from the retreat, in recognition of different European projects relevant to EUREF. Several examples are reviewed, relating to Inspire draft specifications, or Solid Earth (EPOS). The draft document dwells on EUREF activities, reports (e.g. IGS technical report), mailing lists, workshops/symposia. Attachments to EUREF mails are not supported and their feasibility is discussed. EUREF's representation in popular media is discussed. EGU could support a EUREF School. One course could be devoted to how to transform coordinates. Education could be fostered e.g. by a dedicated session at EGU meetings. EUREF is represented in other Organizations, but it must be clarified who is involved in other Organizations.

POUTANEN points out that four categories of targets exist. First our community, second is other communities (EPOS), third is decision makers (e.g. INSPIRE), fourth is the great public.

8. Multi-GNSS WG

- a. General (Brockmann et al.)
New RTCM and RINEX 3 testing. 33 EPN sites provide RINEX3 as to March 2013. Data are available at BKG website. Formats include the 3.00, 3.01 and 3.02 variants. At IGS RINEX3 data are available under MGEX. Naming convention of RINEX files has been simplified, but it is still rather long. Phase shifts in RINEX 3.02 need to be addressed. In RTCM the various manufacturers use different sign conventions for the phase shifts of $\frac{1}{4}$ wavelength. A new SYS/PHASE SHIFT header is mandatory, otherwise data cannot be published in RINEX 3.02.

In RINEX 3.02 draft dated March 2013, Beidou has been added: as C in Satellite system coding; as BDS in station log. First tests at ZIM3 are shown: A 1hr GNSS 3.02 RINEX can have up to 48 observation types.

Files can be generated by the receiver, but there is a dependence on the firmware. Alternatives are converter programs, or get NTRIP data and then use BKG's BNC. BNC2.8 appears a very practical program.

- b. G-Nut software development (Dousa).

Generic library G-Nut and derived end-users applications in C++ are being developed at GOP. The library is designed to support offline and real-time multi-GNSS applications. Several adjustment methods and processing techniques are being developed for troposphere monitoring, precise positioning, multi-GNSS data control and editing and NTRIP client/server/pipe. The beta versions will be available soon with open source policy.

Concerning multi-GNSS

capability, the first focus consists of the developing Anubis application as an alternative to TEQC and BNC while providing Quantity/Quality monitoring for multi-GNSS data in RINEX 2.x and 3.x formats. In future, encoders for RINEX observation and navigation messages will be implemented in order to support saving files from applying editing and splicing/concatenating mode.

9. Role of permanent positions / coordinators, Review of ToR (Ihde et al.)

EUREF organizational entities and positions are reviewed: Plenary, TWG, EPN CB (not mentioned in the ToR), EPN Coordination Group, EPN Data and Analysis Centers, at present 17 (all needed?), EPN Projects and Working Groups. These two do not generate EPN products, but may indicate how to generate one.

Main infrastructure is EPN, results should be made visible to the outside.

Proposed structure in two levels: Level 1 (Plenary, TWG); Level 2 (EPN CB, EPN data centers and EPN analysis centers, Product Centers: Analysis and Combination, Real Time, Troposphere, Vertical Reference Frame; Working Groups: Multi GNSS, reprocessing, ECGN, Deformation models). Actions include the definition of the entities, their mutual relation, positions for the entities and the required changes of the ToR.

BKG cannot continue the EPN Analysis Coordination. Call for Analysis Coordinator to be issued by end of March. The new coordinator should be selected at the AC Workshop and decided at the Symposium. Additional Action: RT product center as a permanent entity, consider the tasks of the EPN data and analysis Centers for different items (RT, post-processing).

10. EPN

- a. BSW5.2 in EPN processing (Brockmann, Dach).

Switch to version 5.2 can be done by adapting old panels while keeping standard processing, or use the new EPN processing options. Safest way is the first.

Comparison of 1 hour set of data (GPS+GLONASS) processed with 5.0 and 5.2 shows very good agreement, except for a scale factor of about 1.3 ppb. BSW5.2 appears considerably faster. LAC's should start testing the new version before the next LAC Workshop and report there their first experiences.

b. EPN Densification (Kenyeres)

IGS08 densification: web pages have been updated. In the mean time IGS08 was updated to IGB08, and this impacts to some extent into the EPN. 55 sites of EPN are in IGS08. Some have solution numbers inconsistent with IGS. Difficulty in including them as reference sites in the densification. Some sites (SOFI, BRST, WTZR, TLSE, ZECK, TRO1) have discontinuities after ITRF2008 became effective. Some other stations (CAGZ, ZIM2, MDVJ) have offsets related to the JPS Regant antenna. Currently the cumulative solution at wk 1710 is in IGB08, but the presence of antenna related problems for some stations causes an inconsistency.

EPN densification is proceeding. Consistency is an issue, particularly regarding the use of IGS05.atx PCV. It is necessary to change to IGS08.atx and reprocess.

c. CEGRN EPN combination (Caporali)

In the framework of the EPN-CEGRN MoU signed in Chisinau in 2011, normal equations of the 2009 and 2011 CEGRN campaigns have been preliminarily combined with the latest EPN realization of IGB08, available at

the EPN Web site. Further extension to previous CEGRN campaigns is foreseen. CEGRN normal equations comply with the Repro1 standards (ITRF2005 frame and IGS05.ATX PCV's, and reprocessed orbits). So do the EPN normal equations resulting from the Repro1 project. Their cumulative solution has however been transformed into IGB08. Hence an inconsistency follows. Guidelines for the Densification should be updated to give users specific instructions. Also, the applicability of the 'memo' transformation to ETRF2000 should be explicitly stated in the Guidelines, when frames different from ITRF2008 are used.

d. Real-time analysis SP (Söhne)

Stations are able to upload data to different casters at the same time. Web page on RT has been reviewed by TWG members.

e. Next EPN LAC workshop (Bruyninx, Söhne).

The rationale of the workshop is explained. Each LAC responsible person is expected to provide a 15 min report on the status of his/her LAC activities.

f. EPN ACC successor (Ihde et al.).

BKG is willing to leave responsibility of ACC to another LAC. A call will be issued and the outcome discussed at the next LAC Workshop in Brussels.

11. Divers

a. Status web publication papers EUREF 2012 (and before) (Caporali).

Already discussed.

b. EPN-REPRO1 paper (Habrich, Völksen).

Participants are not present.

c. COST GNSS4SWEC action

(Dousa).

Action was approved and well ranked. KoM is planned shortly.

- d. EPOS update (Fernandes). WG4 chairs, co-chairs and members have been defined, EPN stations should be proposed by individual countries. UE consultation on possible topics for future activities: proposal is preliminary accepted.

- e. Russian reference frame sub-commission (Ihde).

Initiative of Russian colleagues (KAFTAN) for a reference frame applicable to the Russian area. A proposal to IAG has not been accepted by the IAG. Additional initiatives are considered within IAG and GGOS.

- f. EUREF paper IAG Scientific Assembly (Potsdam, deadline: 21-April-2013) (all).

JI and CB will agree on abstract and contents.

- g. ITRF2013 (Altamimi).

REFAG symposium proceedings are available from Springer. However authors are not entitled to a pdf of their article.

CfP of ITRF2013 is ready, no objection from members of IERS. Correction for non tidal atmospheric loading are foreseen. Tests on different implementation of these corrections appear consistent mutually.

GGIM: Global Geospatial Information Management. UN initiative. Interested in a global reference system. Members are NMA representatives. Doha 2013 High Level Forum (Qatar) resulted in a declaration that '...(the participants)...commit ... to improve a sustained operational global geodetic reference frame...'

12. Next meetings

Next Fall TWG meeting. Invitation in Wien from BEV/OeAW on 24-25 Oct or 28-29 Oct. 2013.

13. Action Items (all)

AI 1. CB to write the text for the terms of reference concerning the EPN CB Data Centers and Analysis Centers.

AI 2. JI to write the text for the terms of reference concerning the Working Groups, Product Centers.

AI 3. AC to send a EUREF mail soliciting papers with the label Proceedings from the relevant EUREF symposium to be published on EUREF web site. No special formatting is required for the papers, but they should include a sub-title indicating the symposium at which they have been presented.

AI 4. AC/JI to solicit session chairs to prepare a list of invited speakers, and remind the EUREF community to submit papers /abstract within the deadline of April 16.

AI 5. WS: to prepare a proposal to the next TWG on possible contents of an EUREF School or Tutorial sponsored by EGU.

AI 6. ALL to inform WS on who is representing EUREF in other Organizations.

AI 7. WS to prepare a questionnaire to be distributed at the EUREF Symposium on the possible contents suitable for EUREF School or Tutorial. Questionnaire to be iterated in the TWG before the Symposium.

AI 8. EB/CB to write a LAC mail to encourage the tests of BSW52 before the next LAC Workshop. Deadline: ASAP

AI 9. JI and AK to prepare a letter to NMCA's encouraging the submission of weekly solutions. Deadline: ASAP

AI 10. AK/CB to update the guidelines for ETRS89 densification. Deadline: ASAP

AI 11. CB, RP and WS to discuss the procedures to monitor the ASI and ROB regional broadcasters in addition to the BKG broadcaster. Deadline: next TWG



AI 12. AC to send out a doodle to select best date for Fall TWG in Wien between 24-25 Oct and 28-29 Oct. 2013.

AI 13. JI to contact Carl Calvert to get clarification on exact denomination of Young Scientists prize.

AI 14. AK to add application on the Symposium WEB site for Young Scientists prize to abstract submission. Add poster format on the symposium WEB page.

AI 15. EB to check all EPN stations who are submitting RINEX 3 data for compliance with formats.

AI 16. JI to write a EUREF mail with the call for a new EPN Analysis Coordinator. ASAP