Recommendations from Session “Multi-GNSS and regional network processing”

1. The IGS shall start studying the opportunity to provide a combined GPS/GLONASS product series (currently orbits, in future clock corrections as far as enough contributions are available):
    - There is a strong user need at least for combined orbit but also satellite clock corrections to provide the opportunity of the multi-GNSS-PPP.
    - In a first step the combined GLONASS—only products file is completed by the combined GPS —only product file by merging both files. The classical combined GPS—only product files is not effected.
    - A study group of experts is asked to develop a multi—GNSS combination software that can manage single system contributions and contributions containing different combinations of the available GNSS in a proper way.
2. Related to the format session the needs of a multi-GNSS processing (not only regarding GPS and GLONASS but also Galileo and Compass) on the file formats shall be considered:
    - **RINEX:** RINEX 3 is defined but still not really in use within the IGS
    - **SP3 orbit:** extension to include more satellites is under discussion already for a long time; it is not clear when the new format will be finalized
    - **clock RINEX:** system specific receiver clock corrections because some of the receivers types show more than a clock offset between the measurements from the two active GNSS
    - **ERP:** there is no need for change
    - **SINEX:** there is no need for change; but possibly it might be nice to indicate the GNSS for some parameters for scientific purposes
    - **Biases:** the world of biases will become much more colors with the planned modernizations of the existing GNSS, with the upcoming new GNSS, and the combinations between the different GNSS (impact to the WG for Bias and calibration)
3. The SINEX format should be extended by a mandatory "reference frame" field in the header record or by a separate "reference frame" block to avoid any ambiguity when used for regional reference frames (e.g., EUREF, NAD83, SNARF and SIRGAS).
4. The link between the RNAAC groups, the AC groups, and the ACC should be improved:
    - RNAAC groups should be informed as early as possible about discussions between the AC groups regarding format changes and model improvements in order to give them time to update their processing to keep the regional analyses consistent with the global analyses.
    - Issues affecting the RNAAC groups should be considered in decisions made by the IGS concerning processing and modelling.
5. The political level of IGS (IGS GB) must decide whether the IGS shall provide an official IGS regional densification product or not. On the other hand, the regional services need to signalize whether they have an interest in such a product for their users or not.
   If such a product is appreciated the GNAAC schedule for the combination of the different RNAAC solutions should be more flexible in consideration of the different RNAAC schedules. Likewise, the RNAAC groups should keep the GNAAC groups informed of their schedules and advise the GNAAC groups of any delays.
6. The visibility of the RNAAC combinations should be improved.