IGS Wuhan Workshop Recommendation Template

Name of Working Group and Chair: *Antenna Working Group, Arturo Villiger*

Rapporteur: Arturo Villiger

Session Highlights:
The main focus of the plenary session was the antenna calibration of receiver antennas and estimation of satellite antenna PCOs. Several institutions have shown their status on the capacity to calibrate receiver antennas. First results for Galileo and Beidou pattern have been shown. Additionally also the estimation of Beidou PCOs has been presented and the impact of the disclosed Galielo pre-launched chamber calibrated satellite antenna presented.

Progress on Paris Workshop Recommendations: *(indicate which recommendations have been resolved, which are still in progress, and what impediments there are to completion)*
- Proposal for an "experimental" ANTEX file containing non-standard IGS patterns (e.g. GPS IIR chamber calibrated PV).
→ ACs are encouraged to validate / verify / test the experimental values:
    Is still open and has been addressed during the splinter meeting. The task is assigned.

- Include disclosed PCO/PCV patterns of the IOV satellites into the IGS ANTEX file (and same for FOC after testing their consistency)
    - Has been achieved

- Considering information on group phase variation for an intermediate update of the current ANTEX V1.4 (to V1.5) (by the end of September 2017)
    - Still open, will be done soon
- Considering a major update of the ANTEX format in conjunction with the MGEX satellite meta data developments (ANTEX V2.0):
    - Decision to active work on the new format was made.

Recommendations: *(Please also indicate who in your group is the point of contact/responsible person for each recommendation, and their contact information)*
- Encourage the calibration centers to start a dedicated validation campaign "ring-calibration". To be presented at the next IGS Workshop 2020.
- Recognizes the lack of missing E5 antenna calibrations. The AWG encourages the calibration centers to extend their software for multi-frequency capacity.
- Working towards a next IGS ANTEX including L5/E5 pattern.
- Provide the IGS ANTEX file for the next reprocessing by June 2019. This includes exploring the possibility to include E5 calibrations and the impact of Galileo pre-launch satellite chamber calibrations.
- Creation of an updated ANTEX format 2.0 (separating satellite metadata and antenna calibrations).

Does this WG actively plan to transition its work to multi-GNSS? If yes, when?
The WG is already in the transition to multi-GNSS and one of its main focus are issues related to multi-GNSS **What impediments may prevent this WG from transitioning to multi-GNSS?**