

## IGS Wuhan Workshop Recommendation Template

**Name of Working Group and Chair:** *Real-time working group (Chair: Axel Rülke)*

**Rapporteur:** Axel Rülke

### Session Highlights:

- Software developments to move the IGS real-time service towards multi-GNSS
- Real-time ionosphere as a future operational product of the IGS Real-Time-Service (IGS RTS) for space weather monitoring
- Suggestions for improvements of the accuracy and reliability of the IGS RTS products, such as machine learning algorithms

### Progress on Paris Workshop Recommendations:

- I. Implementation of long RINEX3 file name based mount point naming across all IGS casters  
*Resolved for the top level casters, still need to be implemented for regional casters  
Removal of old mount points in the near future. (cf. Wuhan recommendation I)*
- II. Raise the level of IT security at IGS Real Time Casters  
*ongoing*
- III. Implement quality control of source tables  
*solved*
- IV. Encourage IGS members to implement proposed SSR corrections messages for interoperability testing  
*No progress within the respective RTCM committee (cf. Wuhan recommendation IV)*
- V. Encourage real time station operators to switch to multi-GNSS tracking  
*Ongoing, while significant improvements have been reached throughout the entire IGS real-time network*
- VI. Start disseminating a real time ionospheric combination product  
*Ongoing, while a significant step forward has been reached, presented in a poster by David Roma-Dollase et al.*

*(indicate which recommendations have been resolved, which are still in progress, and what impediments there are to completion)*

**Recommendations:** *(Please also indicate who in your group is the point of contact/responsible person for each recommendation, and their contact information)*

- I. Complete the mount point renaming on all observation casters of the IGS. Develop a more intuitive naming of product mount points  
*IGS RT DC: Carey Noll, Wolfgang Söhne, Ryan Ruddick, David Maggert*
- II. Improve the validation of broadcast ephemerides records in merged streams  
*André Hauschild, Andrea Stürze*
- III. Make the IGS RTS ready for the transition to a real multiGNSS service. The RT ACs are encouraged to move towards multi-GNSS processing. Capabilities for comparison and validation of multi-GNSS RT solutions need to be built up. As a prerequisite, the RT WG requests the availability of multi-GNSS orbit predictions. *RT ACs: André*

*Hauschild, Denis Laurichesse, Guillermo Tobias, Andrea Stürze, Simon Banville,  
Wenwu Ding, Jing Guo, GFZ Potsdam; RT-ACC: Loukis Agrotis*

- IV. The options available for broadcasting multi-GNSS RT SSR correction data using an open format have to be evaluated and a suitable format has to be selected for the IGS RTS.

*Andrea Stürze, André Hausschild, Denis Laurichesse, Ken MacLeod*

- V. New IT developments broadcasting real time streams in a better scalable way will be actively supported

*Wolfgang Söhne, Ryan Ruddick*

**Does this WG actively plan to transition its work to multi-GNSS? If yes, when?**

The IGS-RTS clearly states its willingness to move forward towards multi-GNSS. A number of prerequisites need to be fulfilled, such as the availability of predicted orbits for all constellations, the availability of processing, combination and validation capabilities as well as the selection of a suitable transfer format. It is expected, that at least at an experimental basis significant progress can be reached until the next IGS Workshop in summer 2020.

***(If applicable)* What impediments may prevent this WG from transitioning to multi-GNSS?**