

Multi-GNSS Working Group

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Overview of the **Working Group Charter**

- Chaired by Oliver Montenbruck, Head GNSS Technology & Navigation Group at DLR's German Space Operations Center
- Conduct Multi-GNSS Pilot Project ("MGEX"); promote comprehensive integration of multi-GNSS tracking and analysis into all IGS components and activities
- Consult and liaise with other IGS Working Groups to ensure adequate consideration of all GNSSs in standards and data formats
- Promote the generation of comprehensive multi-GNSS orbit and clock products; support build-up of a multi-GNSS orbit/clock product combination process within the IGS
- Increase public awareness for multi-GNSS work and facilitate access to relevant information through the IGS multi-GNSS website

Progress since last AM Meeting (Dec 2019)

IGS Workshop recommendations

- Move to long product file names ● , store products in standard IGS directory tree ●
- Generate and host multi-GNSS ultra-rapid products ●
- Implement initial prototype of orbit & clock combination process ● (GFZ, GA)
- IGS GB to take concrete action for multi-GNSS receiver antenna calibrations ● (GEO++)

Key accomplishments

- New RINEX 4 with comprehensive support of new multi-GNSS navigation messages
- Multi-GNSS performance monitoring on MGEX website
- Continued maintenance of GNSS satellite metadata and MGEX website

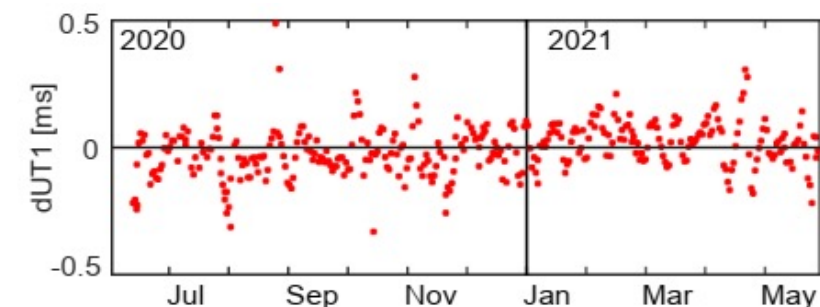
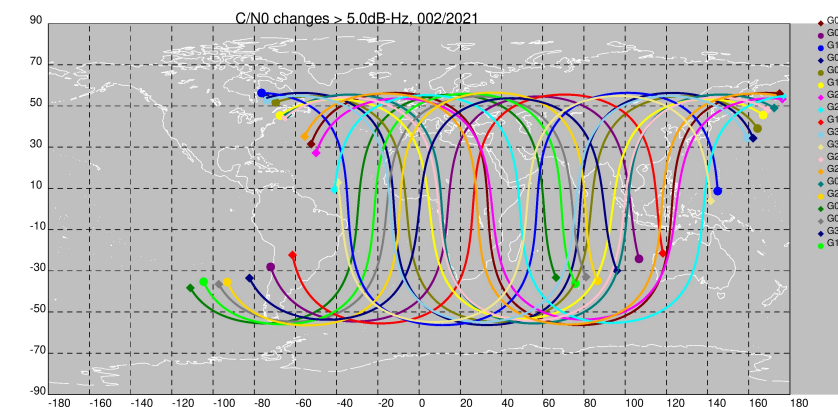
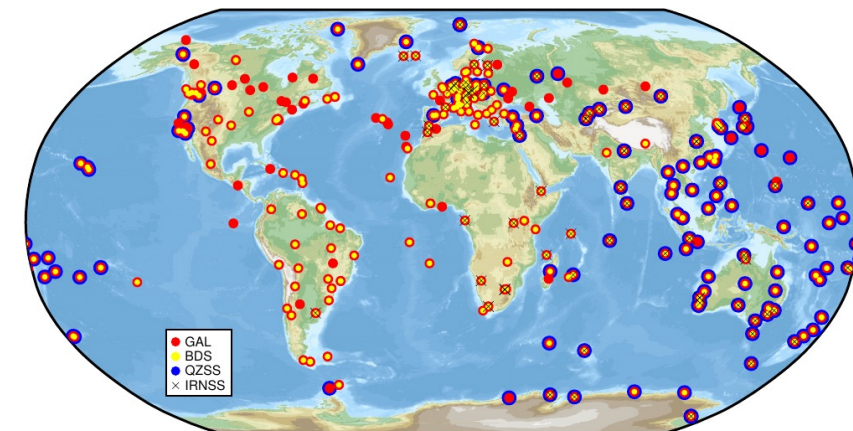
MGEX Status

News (2021)

- 369 multi-GNSS stations
- New GPS IIIA-5, QZSS-1R, Galileo FOC-23/24
- Start BDS B2b PPP service, upcoming GAL HA

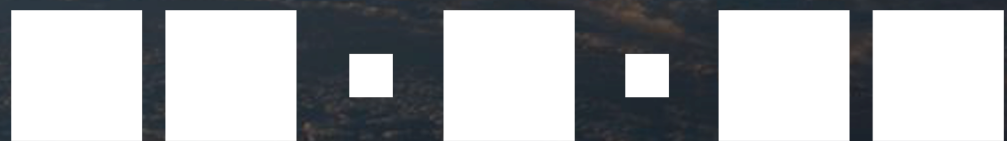
Studies (ongoing; various teams)

- GPS flex power monitoring and DCBs
- Multi-GNSS orbit product combination with VCE (GFZ)
- Broadcast ERPs performance assessment
- BDS-3 product assessment (MGEX Acs)



Future Work

- Coordinate with DCs to move MGEX products to standard IGS product directory
- Promote work on multi-GNSS product combination
 - Definition of multi-GNSS orbit combination concept (Helmert, VCE, EOPs, weights?)
 - Design of clock combination concept (system time, GLONASS handling)
- Modernize antenna and multi-signal handling
 - ANTEX format extension for code and gain patterns
 - Develop concepts for frequency-specific vs ionosphere-free satellite antenna data
 - Study generation of GPS L1/L5 products



IGS

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GNSS SERVICE

Thank You!

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