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ESA Multi-GNSS Products

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ESA's Navigation Support Office, located at the European Space Operations Centre (ESOC) in Darmstadt, Germany, has focused on the combined use of all available GNSS constellations since the beginning of the IGLOS pilot project in 1998. In the meantime the GNSS constellations include Galileo, GPS, GLONASS, BeiDou and QZSS. The analysis of long data time spans helps to get a better understanding of the new satellites and their signals. This activity is a centrepiece of ESA's efforts to constantly improve the products (e.g. precise orbits, clocks, Earth orientation parameters,...) and harmonize the processing across the constellations. Today, ESA's Multi-GNSS processing setup is sophisticated and routinely generating high quality products for all available GNSS satellites. ESA′s Multi-GNSS products are based on a single, minimal-constrained 24-hour network solution of all operational GNSS satellites, currently totalling around 90. Soon this number will exceed far beyond 100. The Multi-GNSS orbits are validated via SLR and convince with low average day boundary differences. With around three centimetres for GPS, four centimetres for Galileo and eight centimetres for GLONASS and BeiDou MEOs, these products became the default or reference product for all Navigation Support Office projects. Concrete examples are the Galileo predictions provided to the ILRS to enable Satellite Laser Tracking for Galileo satellites, the time synchronisation of the UTC realisation at ESOC and the ESA Sentinel POD. Further use is made in various ESA studies like the study on the Independent Generation of Earth Orientation Parameters, conducted by DGFI-TUM, FESG-TUM, BKG, TUW and GFZ. The upcoming IGMA-IGS project will also make use of these products. The Multi-GNSS archive is online available on the Navigation Support Office website under (http://navigation-office.esa.int/) and dates back to January 2014. ESA's Navigation Support Office invites everyone to use and analyse these products and share their results with the GNSS community and ESA in particular.