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VLBI processing at ESOC, the last piece for generating an independent reference frame

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ESOC's Navigation Support Office is providing the geodetic reference for ESA missions and as leader of the Galileo Geodetic Service Provider (GGSP) consortium, also for Galileo. The Navigation Support Office has demonstrated its expertise in the processing of various space-geodetic techniques, such as GNSS, SLR and DORIS and their combination on the observation level. Nevertheless, the last and vital piece missing for the generation of an independent reference frame is VLBI, which is required to define the Earth's orientation.

ESOC's Navigation Support Office is currently extending its expertise to VLBI processing and analysis. We are enhancing the processing capabilities of our work horse software package NAPEOS for VLBI tracking data.

This capability will put us in the position to combine all space-geodetic techniques with one single software package at the observation level. The combination of the different techniques brings together the strengths of the individual techniques. The satellite techniques GNSS, SLR and DORIS are able to determine the Earth's centre of mass, the X- and Y-pole offsets and rates and the Length of Day. However, VLBI is the only technique able to accurately determine universal time (UT1-UTC) and the celestial pole offsets.

The processing of VLBI tracking data will complete ESOC's capabilities in generating an independent reference frame for ESA missions. It will allow us to contribute to the IERS service for UT1-UTC and for the celestial pole offset, whilst at the same time to reduce our dependency on this service. And last but not least our software NAPEOS would become the first software combining all four geodetic techniques on the observation level and thus supporting GGOS, the Global Geodetic Observing System, to get a better understanding of our living planet.

We will present an overview of the current status of the VLBI processing at ESOC and will give an outlook on our future plans.

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