

## Adjustment of orbital elements of Galileo satellite arcs with simulated VLBI observations

*Helene Wolf (TU Wien), Johannes Böhm (TU Wien), Urs Hugentobler (TU München) and Axel Nothnagel (TU Wien)*

**Abstract.** Over the last years, the installation of a Very Long Baseline Interferometry (VLBI) transmitter on satellites has been considered as a future research field with high potential for novel possibilities. With the Genesis-1 mission of ESA, once again, the idea of installing a VLBI transmitter next to GNSS and DORIS receivers and SLR reflectors on a satellite is proposed, realizing co-location in space. Observations to satellites with VLBI telescopes allow the combination of satellite and quasar frames through the unique opportunity of determining the absolute orientation of the satellite orbit in the International Celestial Reference Frame (ICRF).

In this contribution, we present the adjustment of Galileo satellite orbit arcs by estimating offsets for the orbital parameters, such as the right ascension of ascending node. For this purpose, the satellite orbit arc is sampled with observations from a VLBI network over several hours. The scheduling software VieSched++ is used to create a schedule including appropriate satellite observations covering the orbit arc and filling the remaining part of the schedule with quasar observations. The scheduled observations are simulated and further analyzed using the Vienna VLBI and Satellite Software (VieVS). In the analysis, offsets for the orbital elements from the a-priori values are determined based on the Monte Carlo simulations and further investigated in terms of their mean formal errors and repeatabilities.