

VLBI and GNSS space-tie onboard Galileo satellites

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Abstract. Surveying with different space geodetic techniques results in technique-specific terrestrial frames and combining those individual techniques requires links between those frames such as tie vectors. Collocation of different geodetic techniques on Earth-orbiting satellites offers the unique opportunity of continuously measurable ‘space-ties’.

A VLBI transmitter (VT) on future Galileo satellite(s) could realize such a link through the orbital parameters between the positions of the VLBI ground station network which are determined by quasar observations (VLBI frame) and Galileo ground station network which are determined by Galileo GNSS observations (GNSS frame). Comparing the orbit of the Galileo satellites in the two different frames allows it to estimate rotation parameters between them. In this study, we investigate the contribution of a VT to this by evaluating the formal precision of orientation parameters under different geometrical configurations and error sources.