

DETERMINATION OF HIGH-PRECISION MOTION PARAMETERS OF LOW-ORBIT SATELLITES BASED ON MEASUREMENTS OF THE ONBOARD GNSS RECEIVER. METHODS, TECHNOLOGIES, RESULTS AND PROSPECTS

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A technology is proposed for determining high-precision motion parameters (kinematic trajectory, dynamic orbit, reduced-dynamic orbit) of low-earth orbit satellites using observations of an onboard receiver of navigation satellite systems signals. The technology includes: determination of a kinematic trajectory from code observations; determination of a preliminary dynamic orbit; processing phase measurements; determination of high-precision dynamic (reduced-dynamic, kinematic) orbit. Validation of the obtained high-precision motion parameters is done using laser-ranging measurements. From the results, it follows that the use of GNSS observations allows the determination of high-precision motion parameters of low-earth orbiter spacecraft (with centimeter range error). The developed technology can be applied to determine the motion parameters of any low-orbit spacecraft equipped with an onboard GNSS-receiver.

Key words: satellites, motion parameters, navigation technologies, high-precision ballistics.

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