

عنوان مقاله:

The Effects of Gravity on the Satellites Orbit and Trajectory

محل انتشار:

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خلاصه مقاله:

The Earth is in the form of a chamfer glob that its diameter at the equator is about ۲۰ km, more than the diameter of the pole. This low flattening (chamfering) plays a disturbance role for the satellites. Regarding to the satellite angular momentum, the orbit behavior, is similar to a gyroscope, and reacts with the motion of an orbital page and it makes of the nodes to some degrees in a day. Apart the secular disturbances of the orbit, non-spherical of the Earth, causes a variety of additional disturbances that effect on the orbital parameters and will have the greatest impact (the most significant effect) on the near-Earth and low-altitude satellites. So far using various methods, the Earth's gravity field and its heterogeneous effect on the direction of the satellite have been studied. The effect of non-spherical nature of the Earth (advent in different geoid models) to the direction of motion and orbit parameters to a satellite sample will be studied in this paper. Using different methods, including ground-based measurements and mapping as well as considering the satellite moving in respective orbits, the gravity (geoid) can be modeled. The accuracy of different geoid models makes some changes in the direction of simulated flying objects. In this study it has been tried to investigate the effect of different gravity models on this simulation with dynamic simulation of a low orbit satellite. First, the relations for modeling of the gravity field have been investigated and then, using different geoid models and (different) Geopotential coefficients, the changing path of these satellites in the orbit (changes in orbital parameters) is analyzed. In the end, to ensure the performance of circuit simulation program, the obtained results of this program will be compared to the findings of the STK software for the sample satellite. The Earth is in the form of a chamfer glob that its diameter at the equator is about ۲۰ km, more than the diameter of the pole. This low flattening (chamfering) plays a disturbance role for the satellites. Regarding to the satellite angular momentum, the orbit behavior, is similar to a gyroscope, and reacts with the motion of an orbital page and it makes of the nodes to some degrees in a day. Apart the secular disturbances of the orbit, non-spherical of the Earth, causes a variety of additional disturbances that effect on the orbital parameters and will have the greatest impact (the most significant effect) on the near-Earth and low-
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کلمات کلیدی:

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