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EVASIVE MANEUVERS OF OPERATIONAL VEHICLE BY HALL PROPULSION IN SPACE DEBRIS
COLLISIONS

Abstract

In this paper we present a study of dynamics on a space debris and operating a vehicle subject to the Earth's gravitational field and a thrust plasma (Hall propulsion) to implement evasive maneuvers in regions LEO, MEO and GEO. We adopted an approach based on the relative dynamics between the objects on a collisional course and with a short warning time and establish a semi-analytical solution for the final trajectories of these objects. We studied the characteristics of the Hall thruster and viability of these maneuvers, considering the instability of the plasma and electromagnetic related functions. Our results show efficiency curves with respect to the propellant chemical propulsion. In addition, we obtained evasive maneuvers in different regimes of current Hall and in different space regions.