

CONTROL ID: 2248240

TITLE: Space missions orbits around small worlds

ABSTRACT BODY:

Abstract Body: Space missions under study to visit icy moons and small worlds in our solar system will requires orbits with low-altitude and high inclinations. These orbits provides a better coverage to map the surface and to analyse the gravitational and magnetic fields. In this context, obtain these orbits has become important in planning of these missions. Celestial bodies like Haumea, Europa, Ganymede, Callisto, Enceladus, Titan and Triton are among the objects under study study to receive missions in a near future. In order to obtain low-altitude and high inclined orbits for future exploration of these bodies, this work aims to present an analytical study to describe and evaluate gravitational disturbances over a spacecraft's orbit around a minor body. An analytical model for the third-body perturbation is presented. Perturbations due to the non-sphericity of the minor body are considered. The effects on spacecraft's orbital elements are analyzed to provide the the more useful and desired orbits. The dynamic of these orbits is explored by numerical simulations. The results present good accordance with the literature.

CONTACT (NAME ONLY): Josué Cardoso dos Santos

CONTACT (E-MAIL ONLY): josuesantosunesp@gmail.com

AUTHORS/INSTITUTIONS: J. Cardoso dos Santos, Mathematics, Universidade Estadual Paulista (UNESP), Guaratinguetá, São Paulo, BRAZIL|J.D. Carvalho, Universidade Federal do Recôncavo Baiano (UFRB), Feira de Santana, Bahia, BRAZIL|R. Vilhena de Moraes, A.F. Prado, Space Mechanics and Control Division, Instituto Nacional de Pesquisas Espaciais (INPE), São José dos Campos, São Paulo, BRAZIL|R. Vilhena de Moraes, Institute of Science and Technology, Universidade Federal de São Paulo (UNIFESP), São José dos Campos, São Paulo, BRAZIL|

PRESENTATION TYPE: Poster