## ASTRODYNAMICS SYMPOSIUM (C1) Orbital Dynamics (1)

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# ELECTRIC ?V IN SOLAR ELECTRIC PROPULSION (SEP) AND FLYBY FOR NEAR-EARTH-OBJECTS

#### Abstract

The spacecraft propulsion system have passed for diverse evolutions, leaving combustion engines and arriving at ion propulsion. The necessity of more efficient rockets stimulated the research in this scope. In this work  $\Delta V$  will be analyzed proceeding from an electric propellant acting in set with gravitational maneuvers. The optimization of maneuvers will be approached in interplanetary missions using solar electric propulsion and Gravity Assisted Maneuver attended to reduce the costs of the mission. Exploring the high specific impulse and the capacity of the electric propulsion to obtain a Gravity Assisted Maneuver with the Earth after a year of the departure of the spacecraft. Missions for several close asteroids the Earth will be considered. The analysis suggests criteria for the definition of initial solutions demanded for the process of optimization of trajectories. Will be analyzed optimized trajectories of an spacecraft that leaves a low Earth orbit (LEO) and arrives in an asteroid, in this case the 2002TC70 and 1989UQ, using ionic propulsion, being able to fazer:1 - a direct trajectory; 2 – Earth flyby, 3 - firth flyby in the Earth and second flyby in Mars; 4 - firth flyby in the Earth and second flyby in Venus. The indirect optimization method will be used in the simulations.