

Analysis the Trajectory of the Spacecraft during the Transition to the Planet's Orbit Using Aerobraking in the Atmosphere of the Planet

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Abstract : The paper focuses on the spacecraft's trajectory transition from interplanetary hyperbolic orbit to the planet's orbit using the aerobraking in the atmosphere of the planet. A considerable mass of fuel is consumed during the spacecraft transition from the planet's gravitation assist trajectory into the planet's satellite orbit. To reduce the fuel consumption in this transition need to slow down the spacecraft's velocity in the planet's atmosphere and reduce its orbital transition time. The paper is devoted to the use of the planet's atmosphere for slowing down the spacecraft during its transition into the satellite orbit with uncertain atmospheric parameters. To reduce the orbital transition time of the spacecraft is controlled by the change of attack angles' values at the aerodynamic deceleration path and adjusting the minimum flight altitude of the spacecraft at the pericenter of the planet's upper atmosphere.

Keywords : aerobraking, atmosphere of the planet, orbital transition time, Spacecraft's trajectory

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