



Rendezvous Maneuvers under Thrust Deviations and Mass Variation

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Abstract: The Rendezvous maneuvers are used in many important technological space missions. Today, the interception between space bodies (vehicles, stations, debris, etc.) is far from negligible, due the large number of such bodies in Earth orbit and the growth of the current rate space activities. The Rendezvous are realized during many satellites special formations, interception between space stations and satellites or spacecrafts, interception between this bodies and space debris, runaway maneuvers, Formation Flying, etc. In this paper, we study the Rendezvous maneuvers between one satellite and other space vehicle, considering the thrust direction deviations and the mass variation in the satellite, due to the non-ideal propulsion system. We found to the noncoplanar maneuvers, one nonlinear cause/effect relations between the position coordinates uncertainty of the vehicle-interceptor and the "pitch" and "yaw" deviations. Besides, this relation is weighed by time penalty functions, due the variation mass effect. This model is very close to the realistic case and can be implemented inside the technological missions range to the thrust deviations.

Keywords: *Rendezvous; thrust deviations; mass variation.*

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