

Orbital Deflection of Near Earth Asteroids

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Most of the asteroids exist between the Mars and Jupiter orbit called main-belt. However, some of the asteroids approach and cross the Earth orbit. They are called Potentially Hazardous Asteroids (PHAs) which might impact the Earth. Many kinds of strategies are considered to prevent the asteroid collision with Earth, and deflection of the PHAs by kinetic energy is more effective than fragmentation of the body. This talk shows the optimal trajectory of deflecting PHAs under uncertainty of velocity increment. And the optimal trajectory is evaluated by maximizing the worst approach distance. Another approach is to investigate the possibility of an asteroid (NEA) survey mission enabled by advanced solar sailing technology. The study is focused not on the solar sail spacecraft itself but on its orbital dynamics to realize the missions. A novel NEA flyby survey mission with a lightweight solar sail spacecraft to increase the accessibility to NEA flybys located in the vicinity of the Earth's orbit is proposed, which can also be applied to deflecting the asteroids.

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