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# Optimal Intercept/Rendezvous Trajectory for Earth-Crossing Asteroids/Comets

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There exists an infrequent, but significant hazard to life and property due to impacting asteroids and comets. To deflect the dangerous Earth-crossing object, a spacecraft should carry a mitigation system as a payload to the particular celestial body. For interception and rendezvous trajectories, optimization problems in three dimensions is formulated to minimize flight time with moderate propellant mass. The spacecraft requires an advanced propulsion system capable of rapid rendezvous with the object, and an extremely powerful electrical generator, which is likely needed for the propulsion system as well. The optimal thrust-vector history and propellant mass to use are found in order to transfer a spacecraft with an advanced propulsion system from the Earth to a targeted celestial object.