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STUDY OF DEORBITING MECHANISMS OF NEAR-EARTH ASTEROIDS USING SLIGHT DEFLECTION METHOD

Abstract

There are many asteroids in the cosmos, out of which the ones present near Earth are the ones that we are mostly concerned with. These Near-Earth Asteroids pose potential threats to the planet itself including the possibility of impact on Earth while causing significant damage. One of the methods that are proposed to mitigate this risk is the Slight Deflection Technique which entails altering the trajectory of the asteroid to avert a collision. The focus of this study is to investigate the use of Slight Deflection Method for the deorbiting mechanisms of Near-Earth Asteroids. The research methodology comprises a coalescence of theoretical analysis, numerical simulations and experimental evaluation. By the means of analyzing the dynamics behind asteroid deflection, we aim to discern the key factors affecting the utilization of this method. In our analysis, we consider asteroid characterization based upon its albedo, class composition, light diffraction pattern and its orientation. Numerical simulations are to be conducted to model different propulsion systems and deflection strategies being employed in various situations of asteroid deflection. These simulations will help us gain an insight into the most ideal parameters for successful deorbiting of Near-Earth Asteroids. In addition to this, the experiments will be carried out using scaled models to verify the precise effectiveness of the proposed method. The outcomes of this study are trusted to contribute majorly to our current understanding of asteroid deflection techniques and their implementation for planetary defense. We aim to develop strategies that can profusely safeguard our planet from potential impact events. In conclusion, the research aims to develop our knowledge of the asteroid deflection methods and gain valuable insights that can be employed for future planetary defense strategies. The threat of Near-Earth Asteroids has a potential to be more affectively averted through the findings of this study.