Title:

Space Debris Remediation: Particle Cloud Momentum Interceptor Method

Abstract:

Space debris remediation aims to remove potentially damaging man-made objects from vital orbits. This project seeks to achieve this by launching a two-stage rocket that intercepts targeted space debrie. The second stage then deploys a Particle Cloud Momentum Interceptor (PCMI) in its path causing it to de-orbit. This method utilizes a material cloud strategically sprayed in the debris’ path resulting in the object gradually slowing down without being immediately damaged. Once the debris has lost sufficient momentum, changing its orbital dynamics, the debris will de-orbit safely due to increased contact and friction with the atmosphere. This article first examines the feasibility of such a system. Then progressing into modeling of the following: the quantity and density of the particles necessary to achieve this de-orbiting, the parameters for the PCMI’s pathway at the requested altitude, the generation of the PCMI itself, and the thermodynamics of the interaction between the PCMI and the debris.