

# Clearance of Space Debris and Mitigation

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## Abstract

Orbital debris in low Earth orbit ranging in size from 1-10 cm in diameter poses a significant problem for space vehicles. It will be difficult to track the smaller debris reliably and prevent collision with spacecrafts. Such debris can cause catastrophic damage even to shielded spacecraft. To sustain the satellite system which is considered the “life line of modern world” some steps are proposed in this paper. Radiation pressure is the pressure exerted upon any surface exposed to electromagnetic radiation. If absorbed, pressure is the energy flux upon the speed of light. The radiation pressure produces vibration in its eccentricity, resulting in a change in the orbital velocity. The result indicated that the maximum linear momentum and kinetic energy increases as the particle increases. This method is much feasible and economical. Although radiation pressure is feeble it is strong enough to eliminate small diameter debris. Due to the technological advances in optics, a ground based laser could ablate or vaporize the surface of orbital debris, thereby producing enough cumulative thrust to re-enter the atmosphere. One laser tactfully can remove all of the space debris in 3 years or less. A new innovative idea is the use of combination of radiation pressure and laser ablation. One can use the radiation pressure and concentrate the energy thus activating a laser beam and hence solving the problem of efficiency and cost effective.