SPACE DEBRIS SYMPOSIUM (A6)
Poster Session (P)

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ANALYSIS OF SPACE DEBRIS AND SLOW DOWN IT'S VELOCITY

Abstract

The population of hazardous objects in low earth orbit is expected to increase exponentially in coming decades if active debris remediation efforts are not undertaken. There are few methods proposed by us that may include use if nanotube mesh technique using laser and nanobot, recycling of space junk and energy production from space debris. But in order to implement these techniques we have to slow down the speed of debris. A method to shorten space debris orbital life is presented. The mitigation calls for Nano-satellites capable of releasing non-Newtonian fluid droplet streams which can be accurately projected onto the debris surface with high relative velocity. When droplets impact the debris, the target's orbital velocity will decrease. The momentum transfer will lower the debris altitude, hasten atmospheric re-entry, and remove the object out of the path of operational spacecraft. Challenges in non-Newtonian fluid droplet stream accuracy involve modeling atmospheric drag and droplet impact charge. Precise locations of targets could be sent to the spacecraft after on-orbit data is refined by optical observations from Earth-based telescopes. Methods of refining drag and charging models through in-space experiments between two spacecraft operating in close proximity are described. A conceptual spacecraft design capable of in-space experiments, object detection, and active debris remediation is proposed.