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SPACE DEBRIS SYMPOSIUM (A6)
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REMOVAL OF SPACE DEBRIS USING SATELLITE LASER GUN

Abstract

Removal of space debris is one of the most challenging task that the international community face today. The debris in the LEO and HEO exists because of various reasons, few of them are used rocket stages, non-functioning satellites, satellite collisions, etc. Due to large amount of debris in the critical LEO, every functional satellite and space station faces the risk of impact which can be critically dangerous. This impact creates another set of debris and increases its density in the orbit, posing a threat to the existing and future space missions. This paper presents the idea of debris removal with the help of a laser gun installed on a satellite. The satellite will be placed in orbit and will be manoeuvred by the control room, back here on earth. The satellite will be equipped with a laser gun placed on a robotic arm which will fire the high intensity laser beam at the debris once it is in range of the satellite. This will remove the threat of that debris in two ways. 1) It will melt down the debris due to intense heat. 2) It will exert ample force on the debris to de-orbit it and make it fall towards earth which will then be removed by the phenomenon of orbital decay. The manoeuvrable satellite will be able to remove multiple debris of size range 1cm to 15cm using this laser gun at a high rate. This will help in decreasing the density of the space debris over a considerable period of time and securing the present and future space missions from catastrophic failure that may happen with any collision with such kind of debris.