

## Computation of $\Delta V$ Requirements for Space Debris Removal Using Orbital Transfer

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**Abstract :** Since the dawn of the early 1950s humans have launched numerous vehicles in space. Be it from rockets to rovers humans have done tremendous growth in the technology sector. While there is mostly upside for it for humans the only major downside which cannot be ignored now is the amount of junk produced in space due to it i.e. space debris. All this space junk amounts from objects we launch from earth which so remains in orbit until it re-enters the atmosphere. Space debris can be of various sizes mainly the big ones are of the dead satellites floating in space and small ones can consist of various things like paint flecks, screwdrivers, bolts etc. Tracking of small space debris whose size is less than 10 cm is impossible and can have vast implications. As the amount of space debris increases in space the chances of it hitting a functional satellite also increases. And it is extremely costly to repair or recover the satellite once hit by a revolving space debris. So the proposed solution is, Actively removing space debris while keeping space sustainability in mind. For this solution a total of 8 modules will be launched in LEO and in GEO and these models will be placed in their desired orbits through Hohmann transfer and for that calculating  $\Delta V$  values is crucial. After which the modules will be placed in their designated positions in STK software and thorough analysis is conducted.

**Keywords :** space debris, Hohmann transfer, STK, delta-V

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