

SPACE DEBRIS SYMPOSIUM (A6)
Space Debris Removal Concepts (7)

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ASTRIUM VISION ON SPACE DEBRIS REMOVAL

Abstract

The ability to provide important benefits from outer space is now threatened. The increasing density of debris particularly in LEO orbit is of growing concern. Some debris come from the pieces left behind when payloads are launched into orbit, or break up accidentally. Dead satellites, spent rocket stages, and even loose bolts and wayward astronaut gloves litter the space around Earth, presenting a hazard to crews and hardware in orbit" ([1]). Experts from both NASA and ESA now predict that (even if no more launches of new spacecraft were to be performed) a cascade effect will take place and that the debris population will increase due to collisions of already existing large objects with other object in the next 150 years. The major source for debris is large objects because of their fragmentation through collisions or explosions. It has been predicted that the active removal of around 5 to 10 large objects per year from LEO would reverse the Kessler cascade effect.

Astrium has significantly invested and worked on the mater of heavy debris removal through projects for space agencies (DEOS for DLR, OTV for CNES and Roger for ESA to name a few) and through internal RT activities.

A main goal of Astrium is to be in position to propose assessed credible and attractive solutions, supported by in-space demonstration, of high mass debris removal in the coming years. Therefore, this paper presents its work logic, articulated around three axes:

" A better characterisation of the Kessler syndrome problematic and in-orbit at risk debris with the aim to determine the main system requirements and to optimise different Design Reference Missions.

" Debris removal systems preliminary design allowing fulfilling the Design Reference Missions.

" Technologies characterisation and maturation, according to the needs highlighted through preliminary systems design.

Astrium will present a particular zoom on this last point, with the results obtained from the different engaged studies.

[1] Space Sustainability a practical guide, Secure World Foundation