

SPACE DEBRIS SYMPOSIUM (A6)
Poster Session (P)

Author: Dr. Peter Hofmann
OHB System AG - Munich, Germany, dr.peter.hofmann@online.de

SPACE DEBRIS REMEDIATION USING SOLUTIONS FOR ON-ORBIT SERVICING

Abstract

A6.6 (Space Debris Removal Concepts)

Space Debris Remediation Using Solutions for On-Orbit Servicing

Dr. Peter Hofmann (Kayser-Threde GmbH, 81379 München, Germany, peter.hofmann@kayser-threde.com)
Gerrit Hausmann (Kayser-Threde GmbH, 81379 München, Germany, gerrit.hausmann@kayser-threde.com)
Richard Haarmann (Kayser-Threde GmbH, 81379 München, Germany, richard.haarmann@kayser-threde.com)
Dr. Lutz Richter (Kayser-Threde GmbH, 81379 München, Germany, lutz.richter@kayser-threde.com)

Abstract

Recently the ever-worsening space debris situation in key orbits such as LEO has been the subject of growing international interest. One important element for the solution of this issue is active removal of space debris objects. The necessary concepts and technologies are currently the subject of several studies funded nationally (e.g. in the German DEOS mission), by ESA (Clean Space activities) and by the European Commission (Horizon 2020 COMPET 4).

Munich-based OHB group member Kayser-Threde has a long heritage in this field. Kayser-Threde was responsible for key elements of the ROKVISS robotic arm on the outside of the ISS. Also, Kayser-Threde has played a lead role in the development of the visual navigation sensor system VIBANASS. Kayser-Threde developed the robotic payload of the German DEOS mission during phase B1 and commercial on-orbit servicing has been investigated in the context of the orbital life extension vehicle (OLEV) for geostationary telecommunications satellites. Also here, Kayser-Threde was responsible for the robotic payload.

More recently, Kayser-Threde has led an international consortium to study a commercial service-oriented approach to active debris removal in ESA's ADRS study. Here, cost efficient technical concepts were developed and business models were investigated. A more traditional development has been followed in 2014 by leading a study for ESA's e.Deorbit mission phase A. In this project, different technical approaches were investigated both for controlled deorbiting of space debris as well as for graveyard re-orbiting. Finally, Kayser-Threde is responsible for the target spacecraft in the current phase of the German DEOS.

In this paper the most relevant technical approaches of these activities will be summarized for the international space community. Additionally, promising commercial opportunities will be highlighted.

DEOS is being developed with funding from the German DLR Space Administration. ADRS and the e.Deorbit mission phase A are funded by ESA. The development of OLEV has been co-funded by ESA and by the German DLR Space Administration. VIBANASS is a Kayser-Threde development project co-funded by the German DLR Space Administration (Förderkennzeichen 50RA1001) and carried out in cooperation with the DLR Institute for Mechatronics and Robotics and the DLR Institute for Space Operations and Astronaut Training.