

SPACE DEBRIS SYMPOSIUM (A6)
Space Debris Removal Concepts (6)Author: Mr. Magnus Paulsson
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DRAGON ROBOTIC SERVICE MISSION

Abstract

DragON is a mission proposal to ESA from a team of established European space companies. This IOD proposal provides a technology maturation step on the way to address the growing space debris problem. Active debris removal is only one possible application following this IOD. Other areas like: in-orbit service, in-orbit assembly or any space asset management tasks will gain experience from DragON. The baseline concept is to modify the ballistic coefficient of a LEO object and to allow natural drag to do its work, but with a reduced decay time. Combined with the ability to adjust an object's orbit, a controlled collision avoidance is obtained. The baseline ambition is to physically attach, bolt-on, a passive de-orbit package that carries a deployable drag agent to a non prepared and non co-operative space object. The larger mission goal, with raised complexity, is to catch, grab and hold the space object, in order to achieve collision avoidance and guided navigation during the de-orbit. The mission relies on several enabling technologies that has been proven in separate activities, but newer together in an operational system application. As an integral part of the DragON IOD, a continues real-time communication link to the Robotic Service Vehicle will be demonstrated. This infrastructure will also meet the requirements from many EO and surveillance missions and concepts. The IOD objective is to mature existing technologies, and to provide a heritage application, starting from TRL-5 and move to TRL-8. Core items of the DragON mission experimets are: Autonomous vision based rendezvous, Close Vicinity 3D-Prox-Ops and In-orbit inspection, Characterization of the target object rendering Global and Local features and Attitude/Rate state, Real-time monitoring (telemetry) of the full-orbit ongoing multivehicle Interaction during Prox Ops and Manipulating phases. The paper will present and discuss the mission sequence, involved technologies and how the gained experiences can be utilized in future space consepts.