

IAF SPACE OPERATIONS SYMPOSIUM (B6)  
Innovative Space Operations Concepts and Advanced Systems (2)

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ON-ORBIT SERVICING : IN-ORBIT DEMONSTRATION

**Abstract**

Access to space is becoming more and more affordable, thanks to new technologies and New Space actors, allowing disruptive missions and services to the benefit of end-users. However, the subsequent increased use of space also highlights the need of a more sustainable vision for the future infrastructures. It is not possible anymore to design and launch disposable spacecraft without considering the consequences, and On-Orbit Servicing (OOS) is a first step towards a change of paradigm: the same technologies, typically autonomous rendezvous, refuelling, Orbital Replaceable Unit (ORU) exchange, repair and waste management with robotic tools will be used in future smart, flexible and modular spacecraft.

The growing demand for life extension from commercial satellite customers is an opportunity to support the development of those robotic technologies and solutions, via the OOS market: the end-of-life management of the space assets is fundamental both from an orbital management perspective and for sustainability aspects, soon to be enforced by law.

Designing the right mission to enable a go-to-market for future OOS missions is the main goal for the presented EROSS IOD project. It focuses on the short-term demonstration of the key capabilities like coordinated close rendezvous between two free flying spacecraft (a first in Europe) and robotic operations such as capture, refuelling and change of payload with multi-body dynamics. EROSS IOD showcases a mission design that will provide both life extension and life enhancement to future space systems, therefore answering both short-term customer needs and anticipating future new business perspectives.

The final aim of the EROSS IOD project is to prepare and carry out the last maturation and manufacturing steps after years of RD to fly a European pioneering mission by 2026 with a customer-driven approach. The proposed paper will present how from the targeted market the key technologies have been identified, on which past development the project leverages, and what the demonstration mission will look like.