

Aerospace Europe Conference 2023

Joint 10th EUCASS – 9th CEAS Conference

Abstract #XXX (to be filled by the organizers)

Preferred Topics: SUSTSP

Corresponding author: Emmanuel Onillon

e-mail of corresponding author: Emmanuel.onillon@csem.ch

Type: Oral

Status of corresponding author: Regular

Title

Development of a novel capture system

Authors

E. Onillon ^b, A. Iglesias ^a, S. Liberatoscioli ^a, G. Perruchoud ^b

^a Almatech SA, EPFL - Innovation park - Bâtiment D, 1015 Lausanne, angel.iglesias@almatech.ch

^a Almatech SA, EPFL - Innovation park - Bâtiment D, 1015 Lausanne, sandro.liberatoscioli@almatech.ch

^b CSEM SA, rue Jaquet Droz 1, 2000 Neuchâtel, gerald.perruchoud@csem.ch

^b CSEM SA, rue Jaquet Droz 1, 2000 Neuchâtel, emmanuel.onillon@csem.ch

* Corresponding Author

Abstract

Space Debris mitigation shall now be considered at design stage of next generation of satellites and missions, especially for Low Earth Orbit missions. In this frame, a dedicated standardized interface was previously developed and named MICE, "Mechanical Interface for Capture at End-of-life". Such an interface shall equip new satellite generations.

In continuity of previous ESA developments (PRINCE), in the frame of the CRUSSADER GSTP activity, Almatech and CSEM are developing a gripping system, based on a three-finger gripper mounted on a Stewart platform that provides the required compliance. The system shall be developed to cope with cooperative and non-cooperative targets. The proposed approach does not necessitate the use of a robotic arm.

At term, such a three-finger gripping system will also be enhanced such to allow satellite servicing, improving thus the satellite lifetime, with integration of fluidic, data and electrical interfaces.

The mechanism relies on custom actuators based on brushless motors and plain bearings.

After an initial breadboarding phase with Thermal Vacuum Test validation, actuators are under manufacturing.

A dedicated EGSE is proposed, allowing to drive the mechanism in closed loop.

Development, manufacturing and tests status as well as design challenges are presented.

