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INSIDER, INNOVATIVE NET & SPACE INFLATABLE STRUCTURE FOR ACTIVE DEBRIS
REMOVAL

Abstract

This paper intends to describe Bertin Technologies' INSIDeR concept. INSIDeR is a patented concept associating two key technologies, net capture and inflatable structures. Net capture is a particularly interested solution to have a concept adaptable to debris morphology and tumbling rate. Inflatable structures are a good mean for deployment, easy control and damping of the movement. Debris capture strategy relays on a robust sequence consisting in a progressive chaser and target approach by natural orbit synchronization following net deployment and passive debris locking by relative motion. This limits risk of mission failure due to irreversible actions as well as active orbital manoeuvre costs. This system relies on advantages of both net and inflatable structures concepts, relative to the mission (adaptability to any ADR chaser concept, scalability, High controllability during coupling), the debris targets (adaptability to debris mass, tolerant to debris morphology and spin/tumbling rate, tolerant to debris attitude and position, easy control of the capture system and damping), the system itself (can be almost qualified on ground, cost effective, maturity of each technology, "simple" solution. INSIDeR is a box of about 50 cm edge that can be plugged on any ADR system.