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TETHERED SYSTEMS FOR SPACE DEBRIS REMOVAL: THE TEDDY PROJECT

Abstract

One of the biggest problem related to space debris is to develop a versatile, low weight and compact capture system. A solution that meet these requirements is a net-based system. However, what is the behavior of this system in the space during the operative phase? In addition, what is the attitude of the tether when the de-orbiting maneuver is performed? The Teddy project aims to answer to these questions.

Two nanosatellites, Woody and Buzz, linked by a tether, compose the system. The master satellite (Woody) has all required subsystems on board, the slave satellite (Buzz) instead, includes only the tether deployment subsystem and an IMU to assess its attitude. The tether allows data and power transmission between the two objects as well as the structural link.

The project goal is to represent, in a reduced scale, the debris capture phase that foresees the attitude control of an uncooperative target, made by a chaser (smaller in size) provided by a net-based capture system.