



ESA Dragliner - Coulomb drag based telecommunication satellite deorbiting device

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Dragliner is an ESA project to design, manufacture, assemble and test a breadboard model of a tether-based deorbiting system for Low Earth Orbit (LEO) telecommunication satellite deorbit. It is led by the Finnish Meteorological Institute, and the consortium also contains Aurora Propulsion Technologies, GRADEL and University of Luxembourg. The chosen technology is the plasma brake microtether, which is an emerging propellantless and efficient deorbiting solution utilizing Coulomb drag to deorbit satellites in LEO. The system is very lightweight, small in size and requires little power. It is furthermore autonomous and requires no resources from the carrying satellite during deorbiting.

The main goal of the project is to increase the TRL of the satcom plasma brake to 4. This consists of choice of deployment strategy, configuration of the deorbit system, choosing the material for the tether, finalizing the geometry for the tether, simulations for deorbiting performance as well as tether dynamics, tests conducted on the tether material in zero-gravity laboratory and the initial breadboard model design of the most critical components of the deorbit system. These include the reels for main tether, the main tether itself, as well as a supporting tape tether and its housing. Current deployment strategy, design trade-offs, material selections, most critical components and simulation results will be showcased.