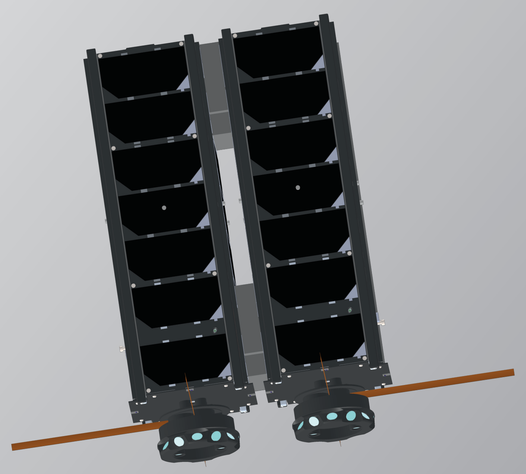
The TAMARIW Mission:
A Pioneering CubeSat Rendezvous and Docking Experiment

Launch as one 6U Satellite

TAMARIW consists of two 3U satellites that will be launched in a docked state as a single 6U. Each side houses identical components, which enable them to act independently, once seperated. The mission is planned for a 2025 launch.



TAMARIW in docked state as a single 6U satellite.

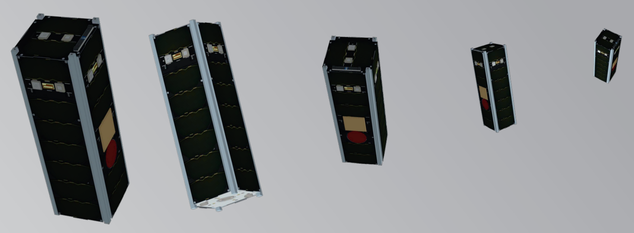
Docking

At close range, the electromagnets are used to connect the two satellites. The TAMARIW mission will provide valuable data for the development of CubeSat R&D technology and will be a crucial step towards future CubeSat missions in proximity operations. The ability to self-assemble on orbit using electromagnets will be a key technological driver for expanding the capabilities of small satellites.

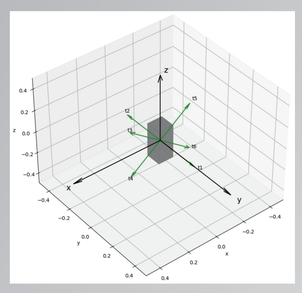
Rendezvous

Using the thrusters, the satellites will close the gap between them up to a distance of <1m, placing them within the range of the four electromagnets.

Once LEOP has concluded, the two satellites will start the experimentation phase by separating only a few centimeters before docking immediately. This gap will increase with each subsequent experiment up to a distance of 500m.



Separate Progressively



Proposed thruster nozzle placement.

Both satellites are equipped with star trackers, sun sensors, magnetorquers, and reaction wheels. Model Predictive Control (MPC) will used for calculating the approach with the six thrusters, while LIDAR, cameras, and electromagnets are used for the docking maneuvers.

Sensors & Actuators

Deutsches Zentrum für Luft- und Raumfahrt
German Aerospace Center

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