

PROJECT LEO-TO-VLEO

Mission driven LEO to VLEO satellites
for defence operations

The main objectives of this project focus on developing a comprehensive business case for the use of Low Earth Orbit (LEO) to Very Low Earth Orbit (VLEO) satellites in military applications, emphasizing their feasibility, benefits, and challenges. The LEO-to-VLEO system operates in a dual-mode configuration: satellites maintain functionality in a low altitude parking orbit within LEO for routine operations and descend to VLEO under conditions demanding enhanced performance. This transition allows for superior resolution and improved sensor capabilities in critical scenarios.

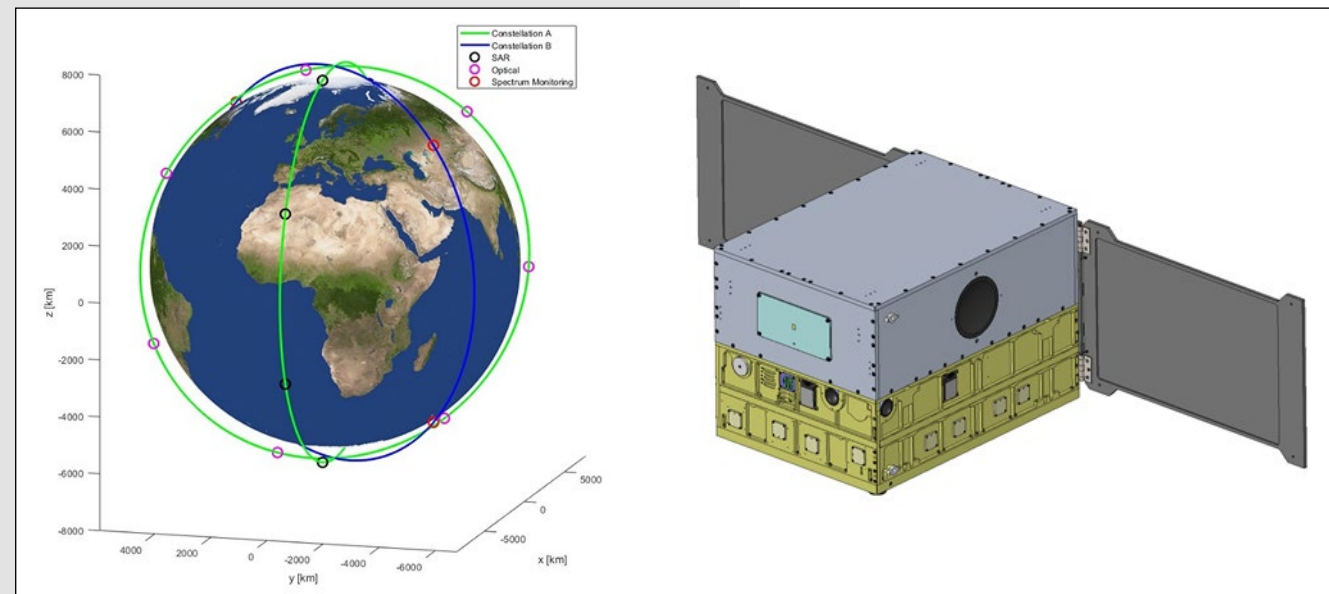
The project seeks to define precise technical requirements for satellite design, covering aspects such as spatial and temporal coverage, sensor capabilities, communication quality, security, and interoperability to ensure alignment with military needs.

A preliminary design phase is also included, involving the creation of preliminary architectural specifications, 3D models, and full-scale mock-ups to validate design feasibility and optimize system efficiency. Additionally, the project prioritizes European non-dependence on critical components and technologies, addressing risks associated with external dependencies and

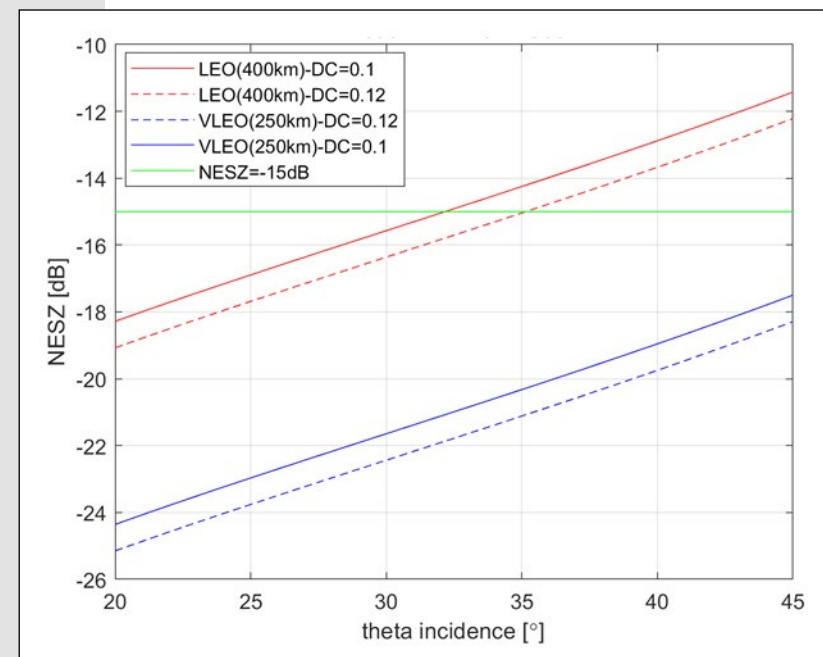
fostering strategic autonomy. Beyond technical milestones, this initiative aims to enhance European leadership in space technology, contributing to its defence capabilities, resilience, and sovereignty in a competitive global landscape.

Keywords: Satellite and payload design, CONOPS, propulsion system.

Technical Sheet
Funding institution:
EDA
Project partners
TYVAK International, Politecnico di Milano, FlySight
Project duration
March 2024 - March 2025
Involved countries
Italy



(a) Satellite constellation (from PoliMi) satellite bus (NEBULA from Tyvak)



(b) SAR payload preliminary performance (NESZ) comparing VLEO and LEO orbits

