

EARTH OBSERVATION SYMPOSIUM (B1)
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NEXT GENERATION HIGH RESOLUTION OPTICAL EARTH OBSERVATION SYSTEMS -
ARCHITECTURE & TECHNOLOGIES**Abstract**

Building on its long experience of High (1m) to Extremely High Resolution observation systems and optical instrument such as PLEIADES (2010, 0.7m resolution), HELIOS 1 and 2., THALES ALENIA SPACE is developing the next generation system and associated technologies, following the different axes to ensure a complete offer:

- Improving the affordability of PLEIADES class performances, thanks to high integration, mass reduction, resulting in a satellite with half the mass of PLEIADES and compatible with low cost launch solutions such as (VEGA in VESPA, or SOYUZ in central ASAP).
- Maximizing the optical observation performances achievable with a medium class launcher (such as VEGA), while ensuring a “clean” satellite compatible with the space operation law. The innovative solution based on technology development targets a resolution twice better than PLEIADES.
- - Developing solution for extremely high resolution system from a higher altitude to ensure with 1 satellite a very good 1 day revisit performances.

The key instrument technologies enabling these breakthrough will be identified with their current technology development plan.

- New generation of TDI detectors and highly integrated video electronics
- Active optics for more compact and lighter telescope
- Innovative thermal control to enable long operation while also reducing PF energy resource.

The service module integrates also significant technologies innovation, such as:

- Highly integrated compression and memory unit
- High data rate telemetry (X and Ka Band) using bi-polar to reach to 2 to 3 Gbps.
- Highly integrated avionics to reduce power and mass
- Electrical propulsion to increase mission capability within a launcher thanks to an injection on a low transfer orbit and end of life perigee lowering (this improves the satellite payload capability on a VEGA launch by more than 100 kg.).

The paper will illustrate these evolutions and the benefits of enabling technologies with satellites under development on in design phases by Thales Alenia Space. It will conclude with a road-map for future optical observation systems and related technologies.