Atmosphere and Climate Explorer Plus

Looking at the Horizon - Innovative Atmospheric Sounding Using Active Inter-Satellite Cross-link Signals

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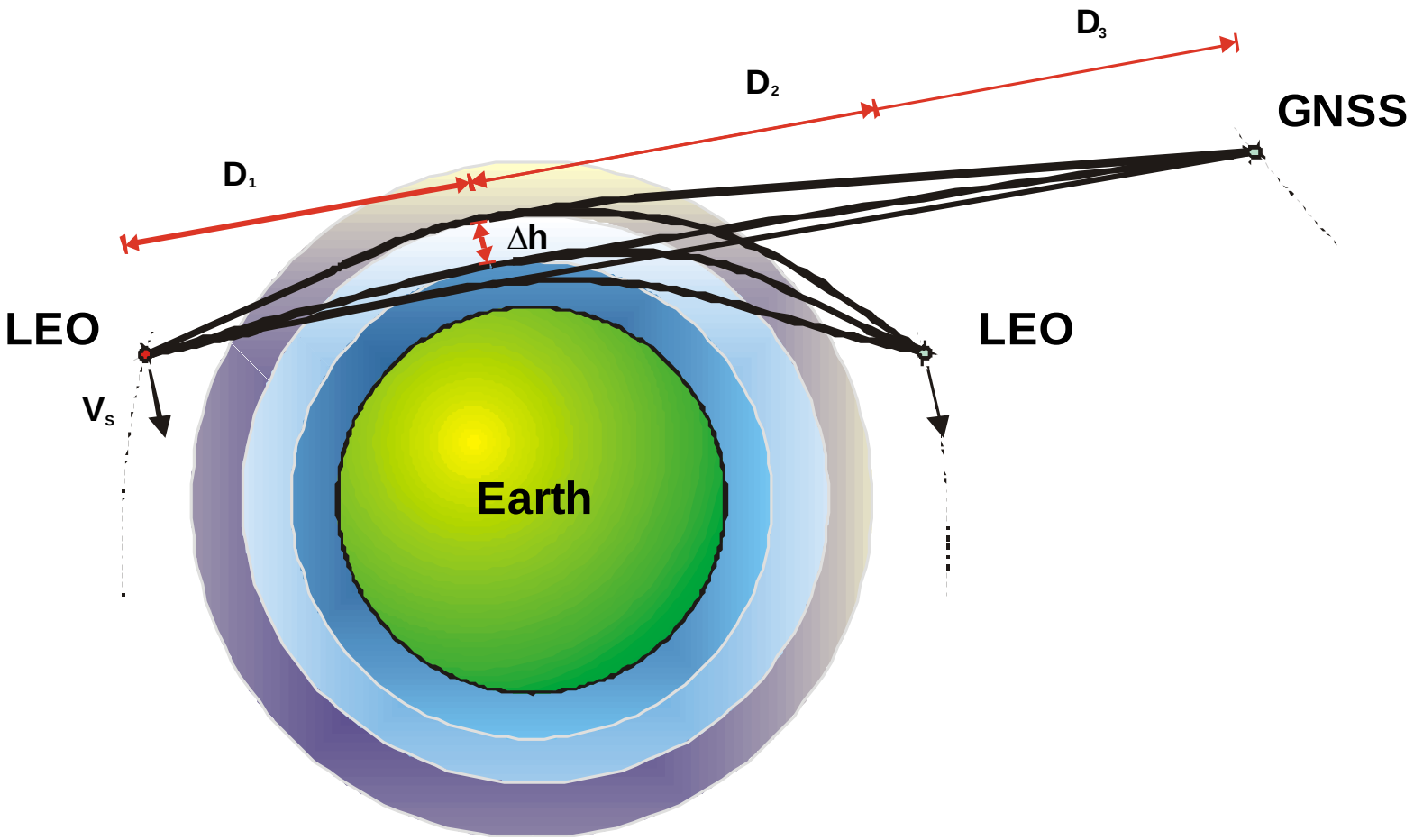
ACE+ mission goals

- To monitor climatic variations and trends at different vertical levels
- To improve the understanding of climatic feedbacks defining the magnitude of climate changes in response to given forcings
- To validate the simulated mean climate and its variability in global climate models
- To improve and tune the parameterisation of unresolved processes in climate models

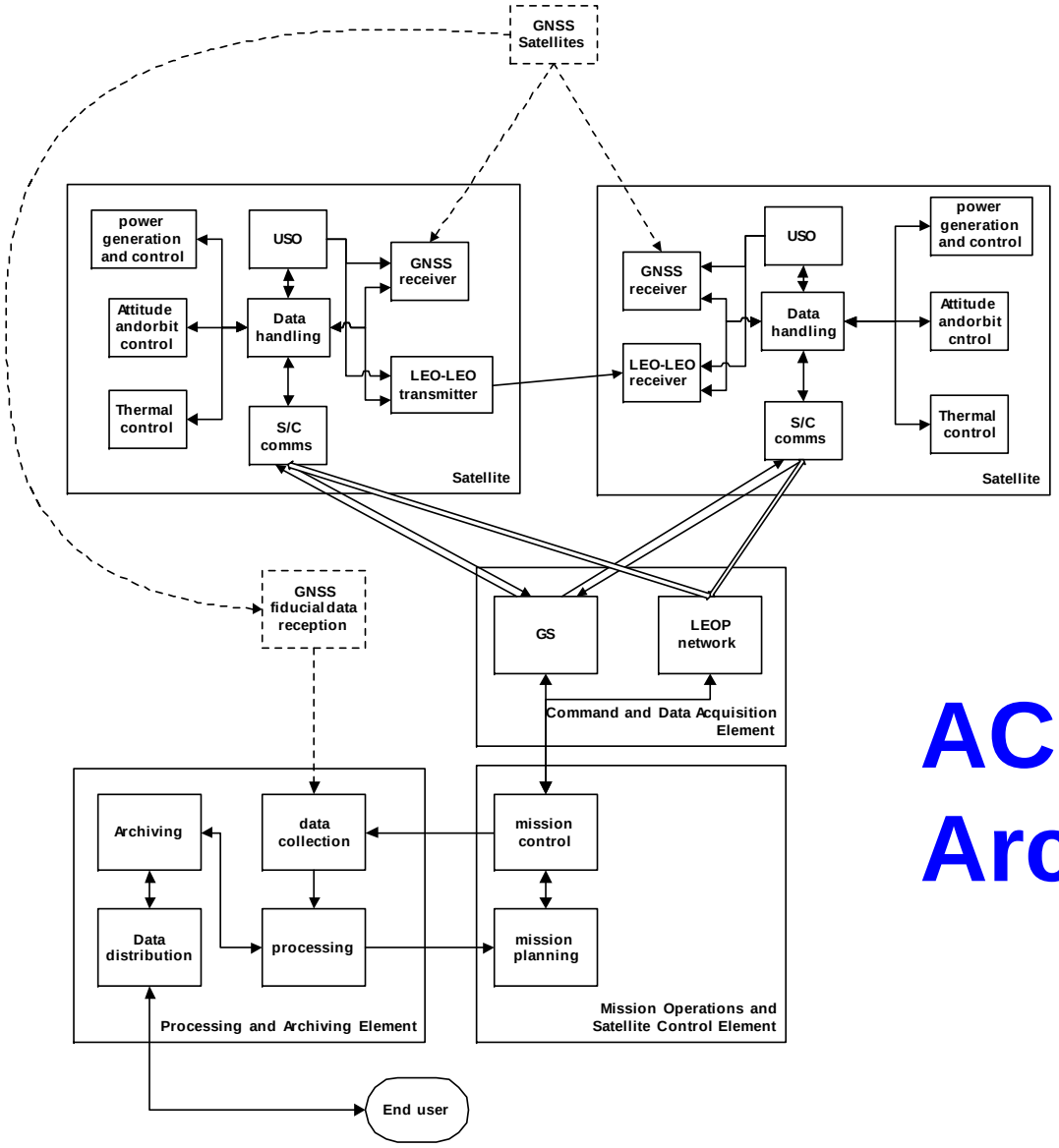
ACE+ measurement techniques



ACE+

- ESA Earth Explorer Opportunity Mission
- Ranked #1 out of 25 proposed missions
- Two other missions in the race: EGPM and SWARM
- Phase A study during 2003, 1st quarter 2004
- After phase A new ranking of the three
- Launch 2007/2008

Swedish Space Corporation astrium Dutch Space EMS Technologies LABEN A FINMECCANICA COMPANY TERMA



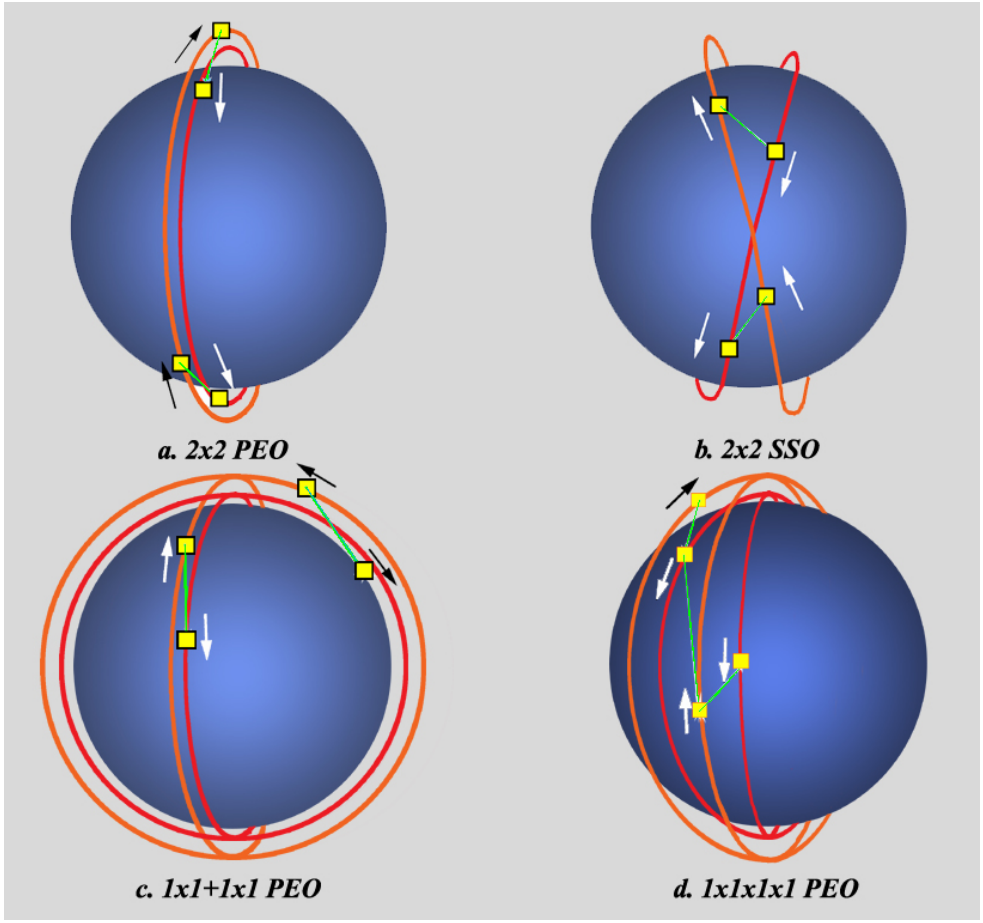
ACE+ Functional Architecture

ACE+ Functional Architecture

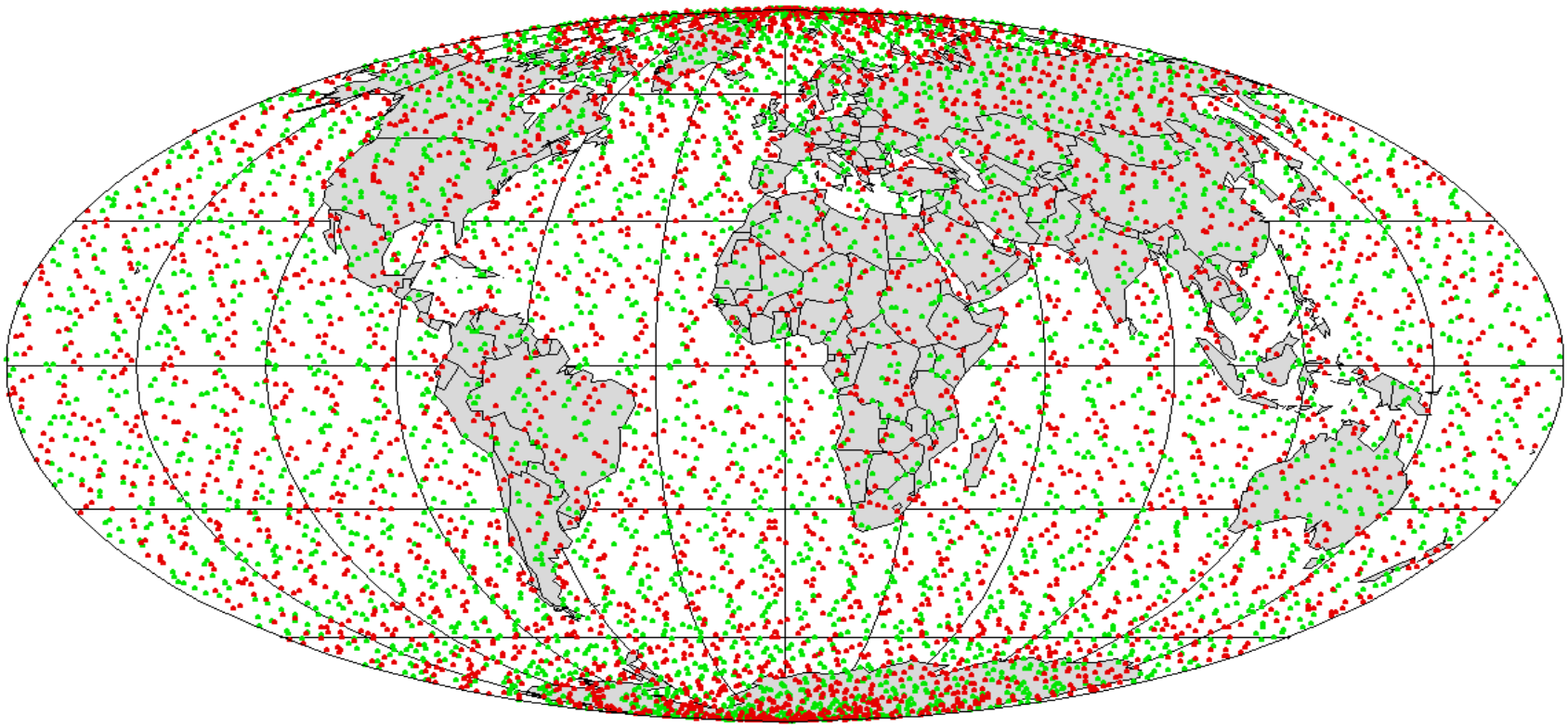
- Satellite platforms,
- GRAS-2 receiver for radio occultation and navigation
- LEO-LEO Radio Occultation Instrument to measure bending angle and transmission around the water absorption line.
- Ultra Stable Oscillator (USO)
- Ground Segment

ACE+ Constellation Options

- Max 4 satellites
- Science performance and cost are key drivers

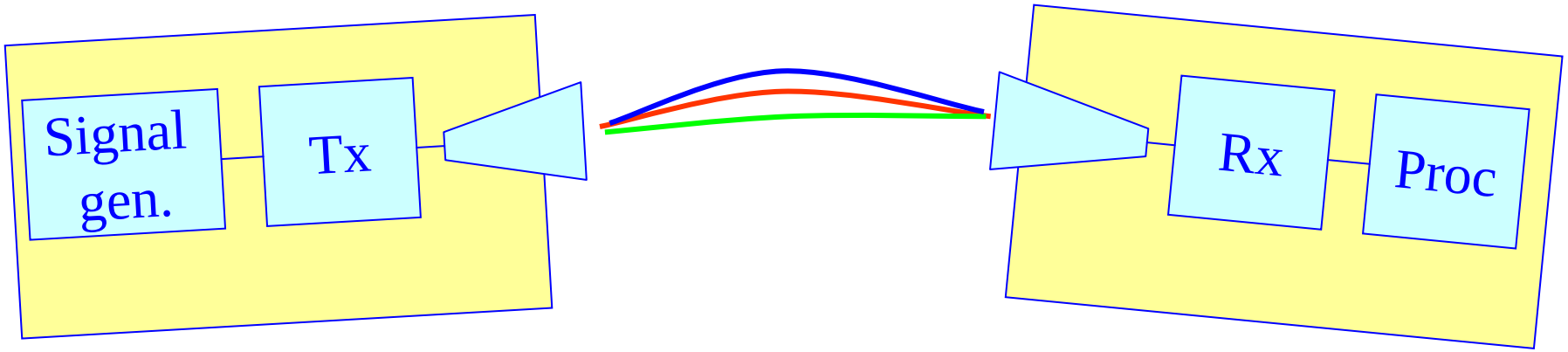


LEO-LEO RO events
1 month



LEO-LEO instrument

- Measurement of attenuation of the signal
- Accuracy of 0.02 dB
- Rigorous control or knowledge of any gain variation of the signal



GRAS-2 Instrument

- Based on Lagrange RO from Laben, GRAS as on MetOp, or American?
- Doppler shift measurements
- Supplies also navigation and timing reference
- Inclusion of GALILEO major trade-off

Spacecraft design

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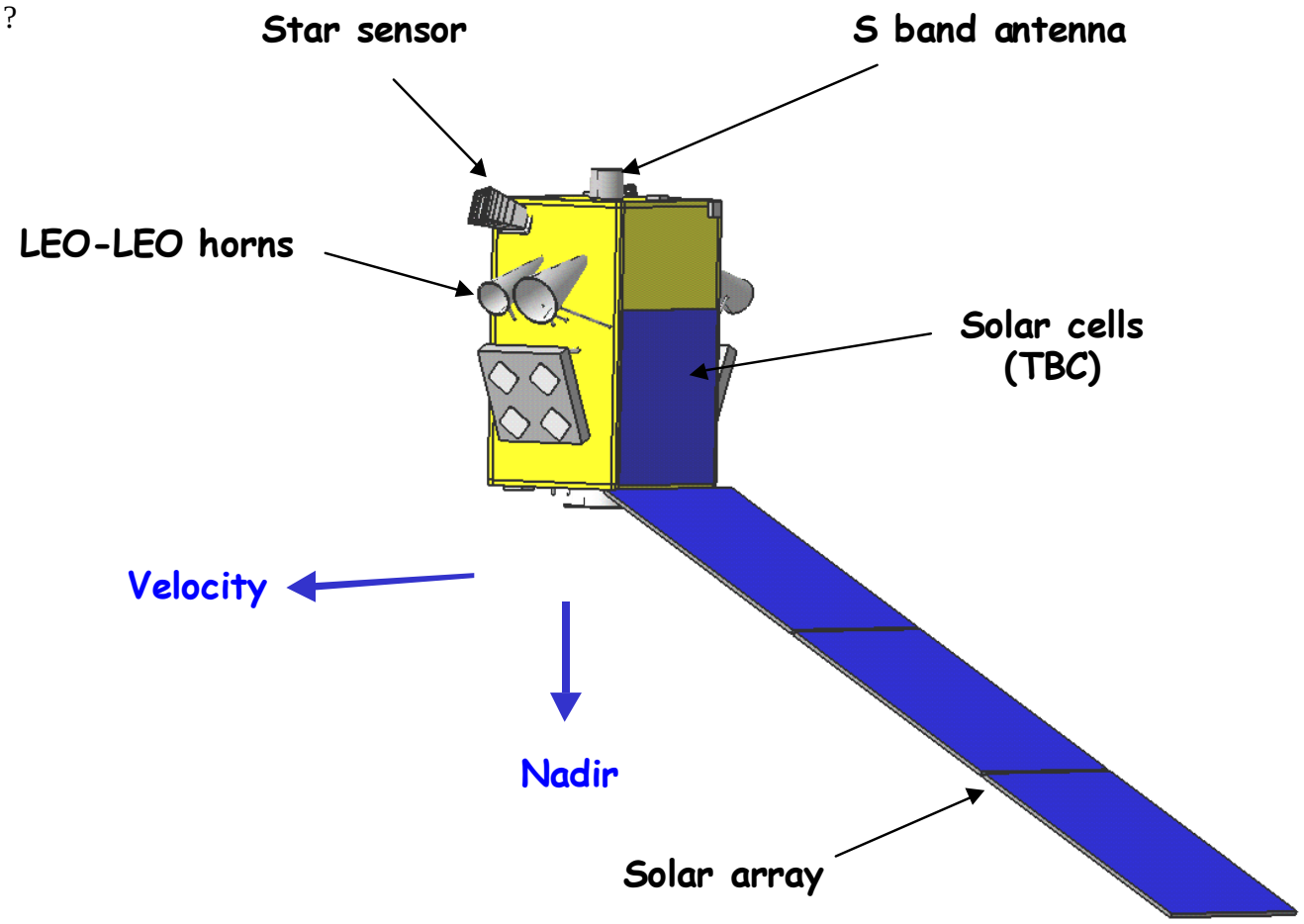

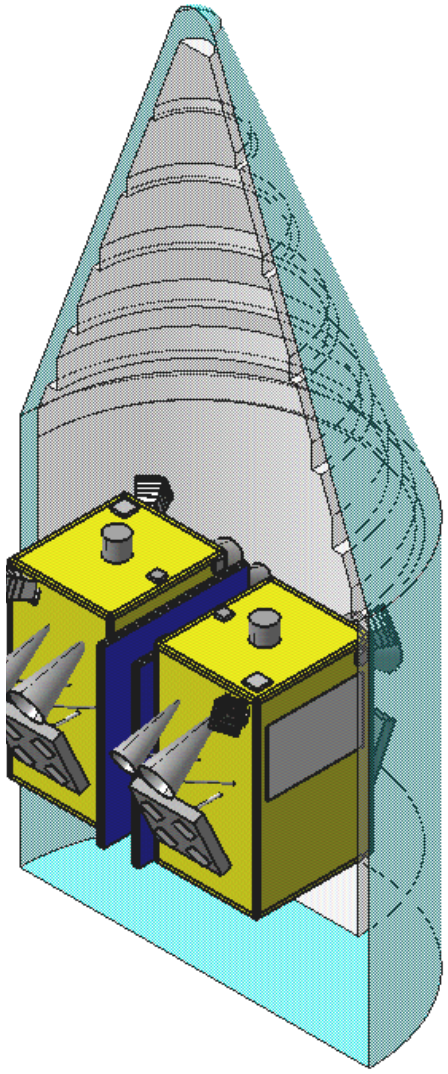

Ground Segment