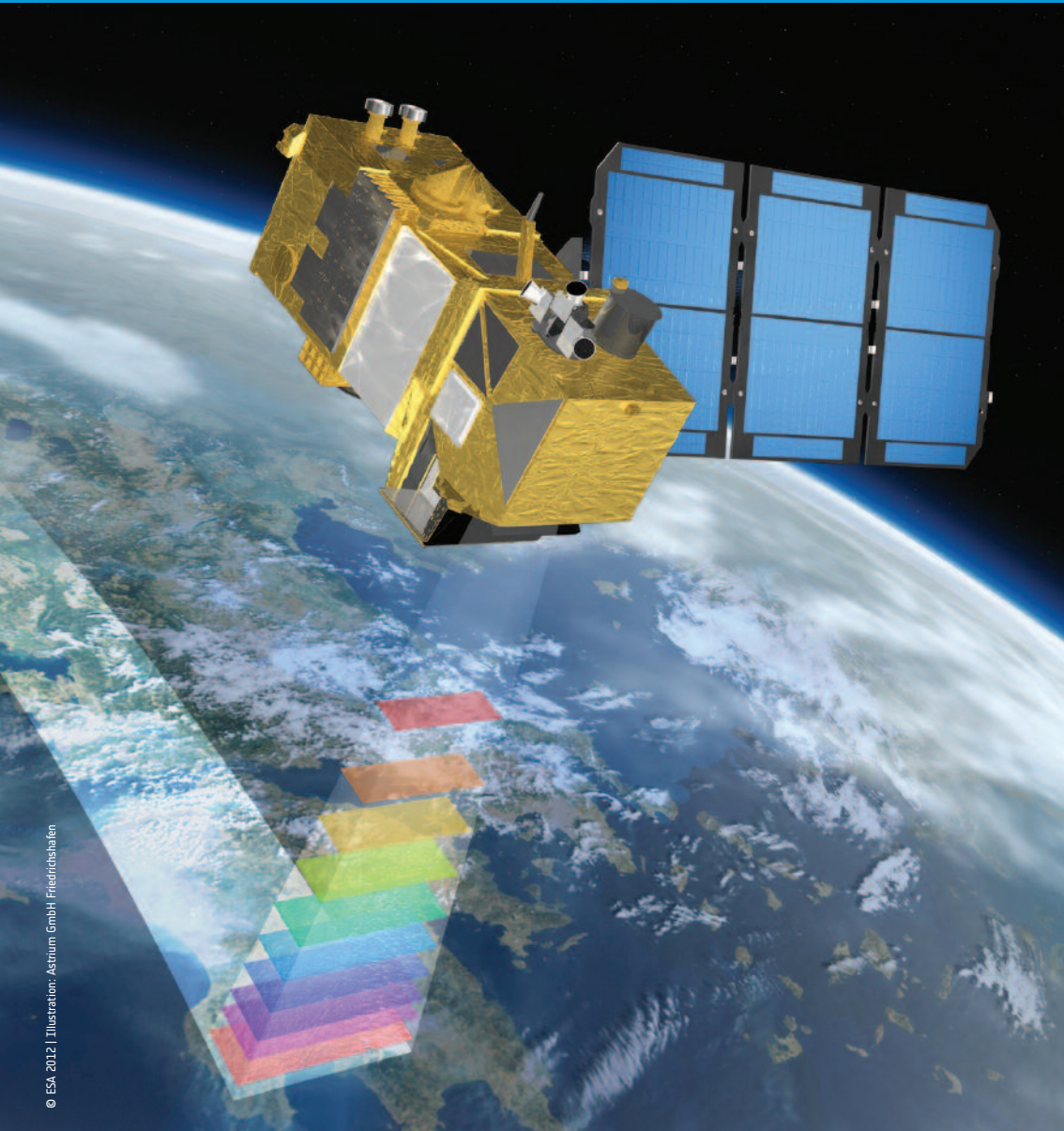
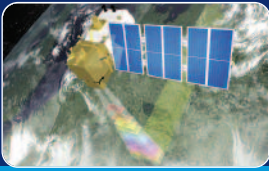


sentinel-2

→ THE OPERATIONAL GMES OPTICAL HIGH RESOLUTION LAND MISSION





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Last update March 2012

MISSION OBJECTIVES

European wide-swath high-resolution twin satellites super-spectral imaging mission designed for data continuity & enhancement of Landsat and SPOT-type missions, for GMES operational land and security services. These applications include:

- › land cover, usage and change-detection-maps
- › geophysical variable maps (leaf chlorophyll content, leaf water content, leaf area index, etc.)
- › risk mapping
- › fast images for disaster relief

MISSION PROFILE

- › Launch: 2013
- › Launcher: Vega or Rocket
- › 7 years lifetime (consumables for 12 years)
- › Sun Synchronous Orbit at 786 km mean altitude
- › Mean Local Time at Descending Node: 10:30
- › Global revisit time: 5 days with 2 satellites flying concurrently (2 to 3 days in extended mode)
- › Twin satellites on the same orbit, 180° apart from each other

- › Land coverage: -56° to + 83° latitude
- › Maximum imaging time per orbit: 40 minutes
- › Nominal nadir pointing, extended viewing capabilities
- › Geo-Location: 20 m (2σ) without Ground Control Points
- › Calibration: radiometric calibration on-board
- › Security: TC authentication
- › Operational configuration comprises 2 satellites

SATELLITE PLATFORM

- › 3 axis stabilized earth pointing
- › Star tracker, inertial measurement unit and 2-band GPS receiver for precise attitude and position knowledge
- › Rate measurement unit, coarse earth sun sensor, magnetometer and magnetic torquers, thrusters, wheels
- › Propellant: 117 kg Hydrazine (N_2H_4)
- › Onboard position knowledge: <20 m (3σ)
- › Onboard attitude knowledge: <10 μ rad (2σ)
- › Launch mass: 1200 kg
- › Satellite dimensions (Stowed): 3.4 m x 1.8 m x 2.35 m
- › Electrical power: › Solar Array: 7.2 m², 1700 W (EOL), GaAs Triple Junction Cells › Battery Capacity: 87Ah (EOL)

- › Satellite power consumption: 1.4 kW (nominal mode)
- › Payload data storage capacity:
 - › 2 Gbits (End-of-Life) TM/TC storage capacity;
 - › 2.4 Tbit (EOL) mission data storage capacity
- › Communication links: › X-Band Science Data: effective 520 Mbps (8 PSK); › Optical Communication Payload for mission data retrieval through EDRS; › S-Band TT&C: 64 kbps up (SPL/PM), 128 kbps (SPL/PM) / 2048 kbps (OQPSK) down
- › Thermal control: passive with Deep Space Radiator. Thermistor controlled Heater Circuits
- › Reliability: › 0.7
- › Availability: 97%

SATELLITE PAYLOAD

- MSI (Multi Spectral Instrument)**
- › Imaging principle: filter based push broom imager
- › Telescope design: Three mirror anastigmatic telescope with Silicon Carbide mirrors and structure, and dichroic beam splitter to separate VNIR and SWIR spectral channels
- › Focal plane arrays: Si CMOS VNIR detectors, HgCdTe SWIR detectors, passively cooled (190 K)
- › Electronics: front end, video and compression electronics, including state-of-the-art wavelet-based data compression

- › Combination of on-board absolute calibration with a solar diffuser covering the full FoV, dark calibration over ocean at night, and vicarious calibration over ground targets
- › 13 spectral bands: 443 nm– 2190 nm (including 3 bands for atmospheric corrections)
- › Spectral resolution: 15 nm– 180 nm
- › Spatial resolution: 10 m, 20 m and 60 m
- › Swath: 290 km
- › Radiometric resolution/accuracy: 12 bit / $<5\%$