



The GMES Sentinel-2 Mission

Bianca Hoersch (1), François Spoto (2), Philippe Martimort (2), Omar Sy (2), Claudia Isola (2), Pier Bargellini (3), Olivier Colin (1), Ferran Gascon (1), Umberto del Bello (2), Aimé Meygret (4), and the Sentinel-2 Team (1) ESA, Earth Observation Directorate, Esrin, Frascati, Italy, (2) ESA, Earth Observation Directorate, ESTEC, Noordwijk, The Netherlands, (3) ESA, Operations and Infrastructure Directorate, ESOC, Darmstadt, Germany, (4) CNES, Toulouse, France

In the frame of the Global Monitoring for Environment and Security programme (GMES) jointly implemented by ESA and EC, ESA is developing the Sentinel-2 system, providing globally with systematic acquisition high resolution (10-20 m) optical observations with a high revisit tailored towards the needs of operational land services. The Sentinel-2 mission is defined by frequent revisit time and high mission availability with two spacecraft operating simultaneously. The orbit is sun-synchronous at 786 km with a 10:30 Local Time at Descending Node.

The Sentinel-2 Multi-Spectral Instrument (MSI) features 13 spectral bands spanning from the visible and near infrared (VNIR) to the short-wave infrared (SWIR), featuring:

- 4 bands at 10m spatial resolution: the classical blue, green, red and near infra red,
- 6 bands at 20m spatial resolution: 4 narrow bands in the vegetation red edge spectral domain and 2 SWIR large bands
- 3 bands at 60m spatial resolution mainly dedicated for atmospheric corrections and cloud screening

The mission is dedicated to the full and systematic coverage of land surface from -56° to $+84^{\circ}$ latitude with the objective to provide cloud-free products typically every 15 to 30 days with a 5 day revisit time. In order to achieve this objective a constellation of two operational satellites is required. The two satellites will be spaced by 180° in the orbital plane.

Data latency will be lower than 3 hours for Near Real Time (NRT) products and lower than 6 hours for most of the other products.

Sentinel-2 will enable operations of valuable information services to the European Union and its Member States in the frame GMES, in areas such as:

- Risk Management (floods and forest fires, subsidence and land slides)
- European Land Use/Land Cover State and Changes
- Forest Monitoring
- Food Security/Early Warning Systems
- Water Management and Soil Protection
- Urban Mapping
- Natural Hazards
- Terrestrial Mapping for Humanitarian Aid and Development.

This system will ensure data continuity of SPOT and Landsat multi-spectral sensor series and further enhancement to account of future service evolution based on improved data availability and quality for users.

The combination of the large swath, spectral range, coupled with the global and continuous acquisition requirement with high-revisit frequency, will lead to the daily generation of about 1.6 TByte of compressed raw image data from the constellation. This corresponds to an average continuously sustained raw-data supply rate of 160 Mbps.

Following the successful completion of the MSI instrument and system Preliminary Design Review in autumn 2008, the MSI and satellite are currently in phase C/D with manufacturing, integration and test of the first equipments already delivered, such as engineering models of MSI detectors and electronics and flight models of the mirrors.

The launch of the first satellite is foreseen in 2013, and the launch of the second satellite about 2 years later.

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