sentinel-5

→ COPERNICUS LOW EARTH ORBIT GLOBAL ATMOSPHERIC MISSION

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MISSION OBJECTIVES

The Sentinel-5 mission covers the needs for continuous monitoring of the atmospheric chemistry at high temporal and spatial resolution from a low-Earth orbit. The mission will provide coherent and long-term information on atmospheric variables in support of European policies and for the benefit of European citizens. The main data products will be O_3, NO_2, SO_2, HCHO, CO, CH_4 and aerosol optical depth, enabling services addressing global air quality monitoring and composition-climate interaction. In particular, it will provide daily analysis of the atmosphere at various space and time scales, key information on long range transport of atmospheric pollutants, initial and boundary conditions for air quality models and sustained monitoring of green-house gases, aerosols and reactive gases.

MISSION PROFILE

› The Sentinel-5 instrument will be embarked on the MetOp-SG satellite A.
› Global coverage is achieved with a daily revisit time.
› Orbit: 830 km Sun-synchronous, 98.701 deg inclination
› 29-day repeat cycle
› Mean Local Sun Time: 09:30 at the Descending Node
› Total number of models: 3, launched at 7 years interval
› Total mission operational lifetime: 21 years

SATELLITE PLAYLOAD

Instrument Elements:

The instrument is composed of the following three units:
› the Instrument Optical Module which contains the optical and detection parts
› the Detection Support Electronics
› the Instrument Control Subsystem

Instrument Characteristics:
› Allocated Mass is 270 kg
› Allocated Average Power is 250 W
› Data Rate during acquisition <= 20 Mbps
› Mission reliability >= 0.75 @ 7.5 years

Instrument Coverage:

The Sentinel-5 instrument is a high resolution spectrometer, covering the following wavelengths bands:
› ultraviolet (270-370 nm),
› visible (370-500 nm)
› near-infrared (685-773 nm)
› short-wave infrared (1590-1675 & 2305-2385 nm)
The instrument consists of 5 spectrometers, in a push-broom configuration with a 108° instantaneous Field-of-View. The UV, Visible and Near-Infrared channels will be acquired using a set of three CCDs, while the Short-Wave Infrared channels will be acquired with two Mercury-Cadmium-Telluride active-pixel sensor arrays. The spatial resolution is about 7 km at Nadir and the spectral resolution ranges between 0.25 nm for the longest wavelengths and 1.0 nm at the shortest wavelengths.