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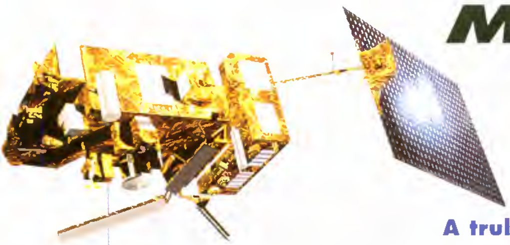
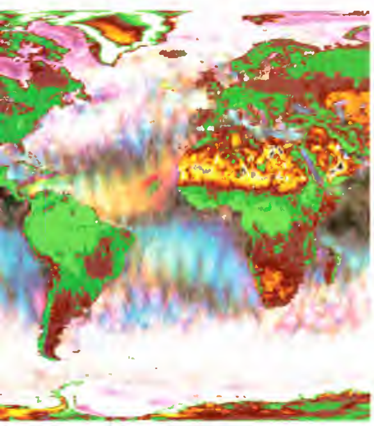


METOP

A truly global picture



While satellites in geostationary orbit provide a continuous view of the Earth from an apparently stationary position in space, the instruments on meteorological polar orbiting satellites flying at a much lower altitude, give more precise details about atmospheric temperature and moisture profiles.

The lack of coverage by geostationary satellites over certain parts of the globe, particularly for northern and southern regions, has led to an increasingly important role for polar orbiting satellites in numerical weather prediction and climate monitoring.

Metop-1, being developed by ESA and EUMETSAT, will be launched in 2003 as the first of a series of three operational satellites providing a service well into the second decade of the 21st century

Metop instruments will produce high-resolution images, detailed vertical temperature and humidity profiles, and temperatures of the land and ocean surface on a global basis. Also onboard will be instruments for monitoring ozone levels in the atmosphere and wind flow over the oceans.

The instrument payload will be of significant value to meteorologists and many other scientists, particularly those studying the global climate.

The Metop satellites will carry instruments provided by ESA, EUMETSAT, the US National Oceanic and Atmospheric Administration (NOAA) and the French space agency, CNES.

The Metop satellites will form the space segment of the EUMETSAT Polar System (EPS), the European component of a joint European-United States meteorological polar satellite system. Both sets of spacecraft will be in sun-synchronous orbits, which means they will pass over a particular region of the globe at approximately the same times each day. Metop will do so in the morning and the US spacecraft in the afternoon. The core meteorological instruments are duplicated on both satellites, ensuring the use of robust and well proven ingestion and assimilation methods for the generation of high quality parameters.

The satellite's design is based on an adapted Polar Platform that ESA is currently developing for its Envisat Earth Observation spacecraft. The platform will allow some flexibility in payload composition, which will be identical for Metop-1 and -2, but may evolve for Metop-3.

The Metop spacecraft will orbit the Earth at an altitude of about 840 km, circling the planet about 14 times a day. As the Earth rotates under the spacecraft, its orbit will be displaced westwards allowing coverage of the entire globe, excepting the Poles. This will happen about once a day, depending on the instrument.

Facts

LAUNCH	2003
MAJOR INSTRUMENTS	Twelve
MASS	Approx 4500 kg at launch
ORBIT	Near-polar sun-synchronous
ALTITUDE	840 km
PERIOD	Five day repeat cycle
POWER	980 W (instruments)
LOCAL SOLAR TIME	09h30m (descending node)

METOP INSTRUMENTS

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Each satellite will carry a set of 12 complementary instruments:

Advanced Microwave Sounding Unit-A (AMSU-A 1&2)*

Measures temperature profiles of global atmosphere in all weather conditions in a swath of ±1027 km. It mainly exploits the 50 GHz oxygen band.

Advanced Scatterometer (ASCAT)

Provides near-surface accurate wind velocity vectors (better than 3m/s) over oceans in all weather conditions over two swaths of 550 km and with a spatial resolution of 25 km. In addition ASCAT will complement other instruments by providing ice and land parameters.

Advanced Very High Resolution Radiometer (AVHRR)*

Provides global imagery of clouds, ocean and land surfaces with 1.1 km resolution at nadir in a swath of ±1447 km.

Data Collection System - Argos (DCS)

Locates platforms on the Earth's surface, oceans or atmosphere and relays the environmental data collected.

Global Navigation Satellite System Receiver for Atmospheric Sounding (GRAS)

Provides temperature profiles of the stratosphere and upper troposphere with a very high vertical resolution (better than 1.5 km) and a root mean square (RMS) temperature error better than 1 K. This instrument might be used to study the ionosphere and the wet path of the troposphere.

Global Ozone Monitoring Experiment-2 (GOME-2)*

Measures profiles of ozone and other trace gases in the upper atmosphere, in a swath commandable at various steps, up to 1920 km. It works in the ultraviolet and visible range.

High Resolution Infrared Sounder (HIRS)

Provides the basic 20-channel temperature and humidity soundings of global atmosphere in cloud-free conditions, in a swath of ±1080 km. Other parameters are surface temperature, cloud information and total ozone content.

Infrared Atmospheric Sounding Interferometer (IASI)

Provides enhanced sounding of the global atmosphere in cloud-free conditions, covering a swath of ±1056 km. The Michelson interferometer ranges from the CH_4 to the CO_2 absorption bands.

Microwave Humidity Sounder (MHS)

Measures the humidity profile of global atmosphere in all weather conditions in a swath of ±1078 km. The channels range from 89 to 190 GHz.

Search and Rescue (S&R)

Alerts emergency services and helps to locate its source.

Space Environment Monitor (SEM)

Senses the flux of charged particles from the solar plasma.

**The AMSU-A, the AVHRR and the GOME-2 instruments may be up-dated for Metop-3.*

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