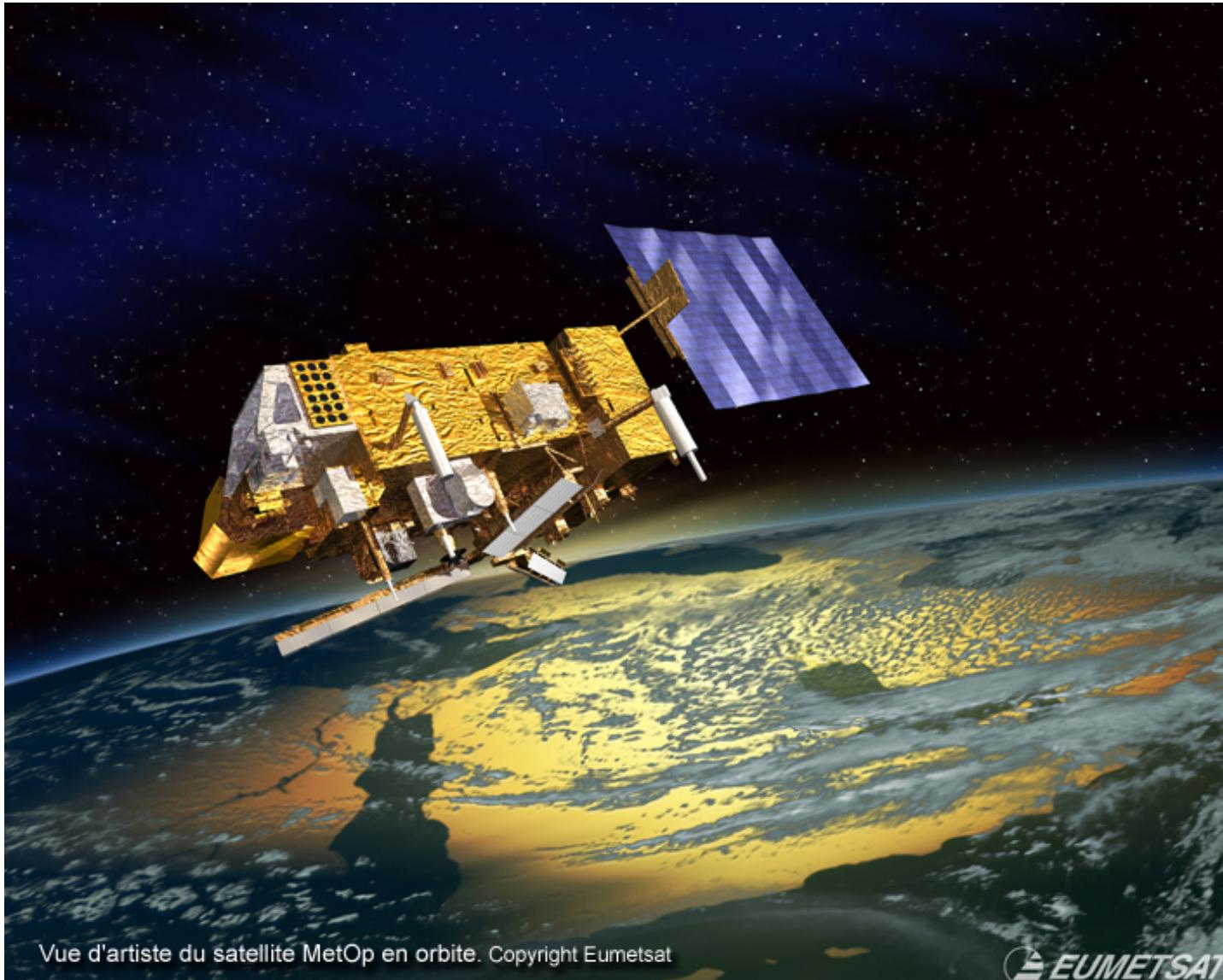


The MetOp-satellites



Vue d'artiste du satellite MetOp en orbite. Copyright Eumetsat



<https://podaac.jpl.nasa.gov/MetOp> (08.03.2017)

Brought to you by Imke Hans

The MetOp-satellites

- ▶ Full name: Meteorological operational satellite
- ▶ There are three of them: MetOp-A, -B and –C
 - ▶ Launch and predicted End of Life
 - MetOp-A:** 19.10.2006 to 2017?
 - MetOp-B:** 17.09.2012 to >2018?
 - MetOp-C:** 2018 to >2021?
- ▶ Controlled by EUMETSAT: European Organization for the Exploitation of Meteorological Satellites
- ▶ Orbit
 - Sun-synchronous, Low-Earth-Orbit (LEO) or “polar orbit” keeping constant local equator crossing time of 9:30 (descending) and 21:30 (ascending)
 - Altitude: 817 km
 - Orbital period: 101 min
- ▶ Dry mass: 3769 kg



MetOp-B at launch site

<https://directory.eoportal.org/web/eoportal/satellite-missions/m/metop>
(08.03.2017)

The MetOp-satellites

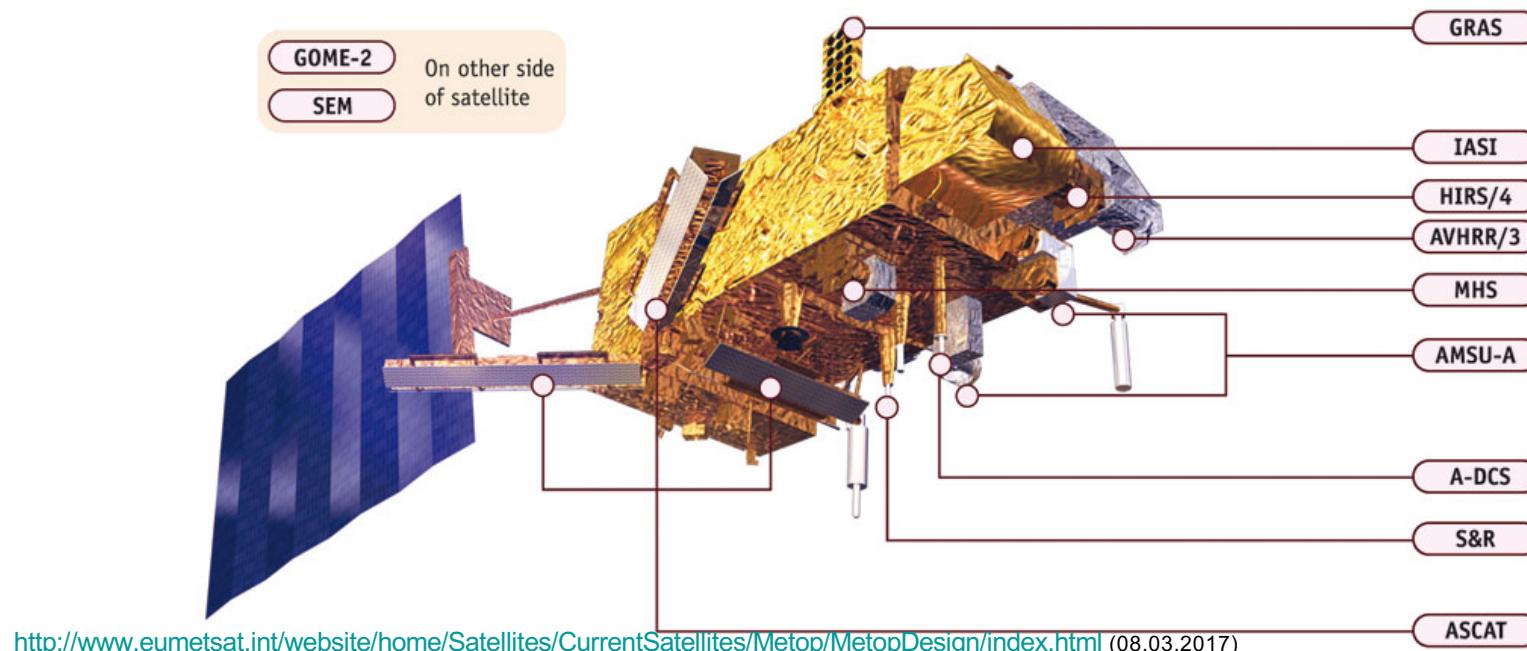
► Instruments:

► also on board US-satellites (from NOAA):

- [AMSU-A1/AMSU-A2](#) - Advanced Microwave Sounding Units
- HIRS/4 - High-resolution Infrared Radiation Sounder (N.B. Not included on MetOp-C)
- [AVHRR/3](#) - Advanced Very High Resolution Radiometer
- [MHS](#) - Microwave Humidity Sounder

► MetOp- specific:

- IASI - Infrared Atmospheric Sounding Interferometer
- GRAS - Global Navigation Satellite System Receiver for Atmospheric Sounding
- ASCAT - Advanced SCATterometer
- GOME-2 - Global Ozone Monitoring Experiment-2



The MetOp-satellites: contribution to Meteorology

- ▶ The instruments' final products provide information on e.g.
 - ▶ sea-surface temperature
 - ▶ global atmospheric temperature and humidity structure
 - ▶ Atmospheric minor constituents
 - ▶ Sea-ice information
- ▶ Data provide global coverage, twice a day
- ▶ Operational meteorology: Measurements of instruments feed into NWP (Numerical Weather Prediction Models)
- ▶ Climate Science: Series of satellites will ensure long-term monitoring of the atmosphere for climate studies

Metop Instrumente

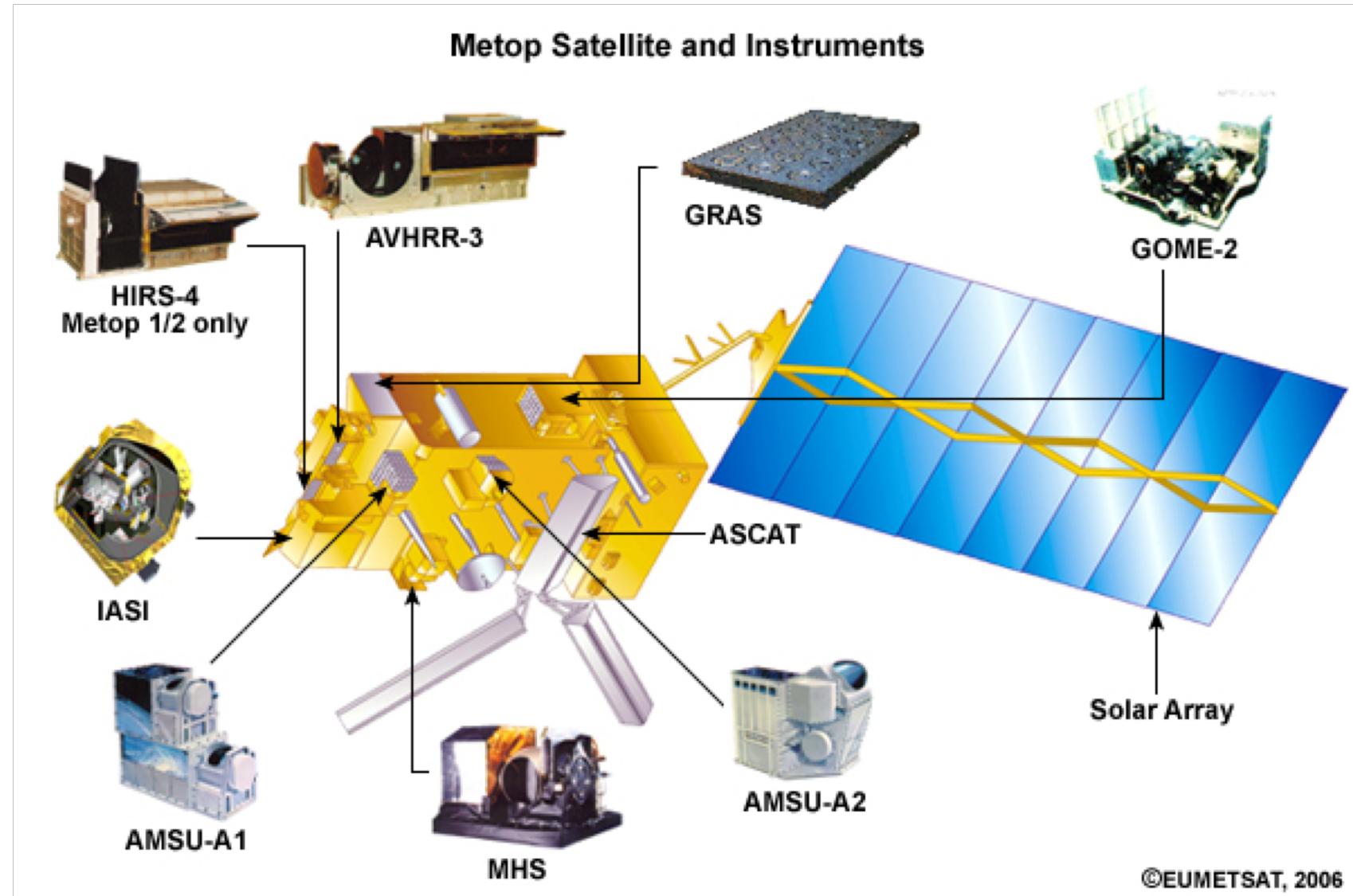
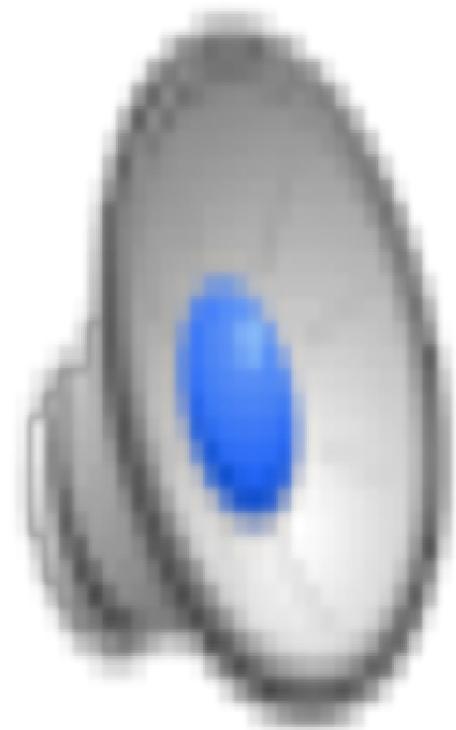


Bild: EUMETSAT

(http://www.eumetsat.int/eps_webcast/eps/print.htm#s1p5)

Metop – The Movie



Quelle: European Space Agency ESA
Stefan Bühler
http://www.esa.int/Our_Activities/Observing_the_Earth/Orbits_and_Satellites/Programme/Meteorological_missions/MetOp/Overview 6

Instrumente

Auch auf NOAA Satelliten

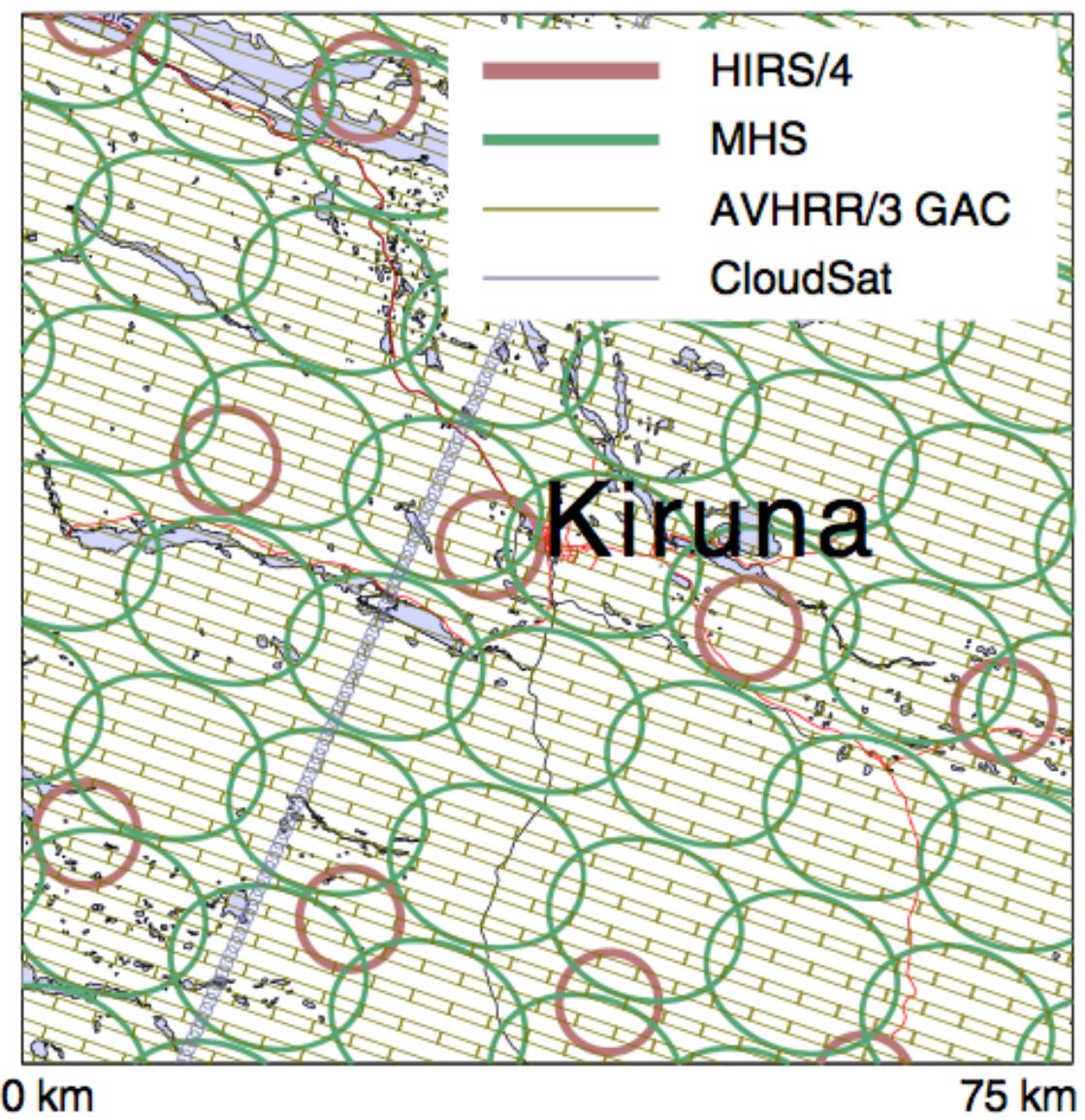
Instrument	Spektralbereich	Auflösung
AMSU	Mikrowelle	15-50 km
HIRS	Infrarot	50 km
AVHRR	Sichtbar/Infrarot	1 km
IASI	Infrarot (hyperspektral)	25 km (1-2 km vertikal)
GRAS	1.2 und 1.6 GHz	Okkultation

Verschiedene Instrumente und Kanäle machen verschiedene Sachen sichtbar.

Nur manche Kanäle sehen den Boden.

Horizontale Auflösung

- Sehr unterschiedlich



Holl, G., S. Eliasson, J. Mendrok, and S. A. Buehler (2014), SPARE-ICE: synergistic Ice Water Path from passive operational sensors, *J. Geophys. Res.*, **119**(3), 1504–1523, doi:[10.1002/2013JD020759](https://doi.org/10.1002/2013JD020759).

Der NOAA KLM User Guide

- ▶ Beste (grob)-Referenz für alle operationellen meteorologischen Satelliten.
- ▶ NOAA K → NOAA 15 (L→16, etc)
- ▶ <http://ncdc.noaa.gov/oa/pod-guide/ncdc/docs/klm/index.htm>