AeroCom 2015

Welcome to ESRIN

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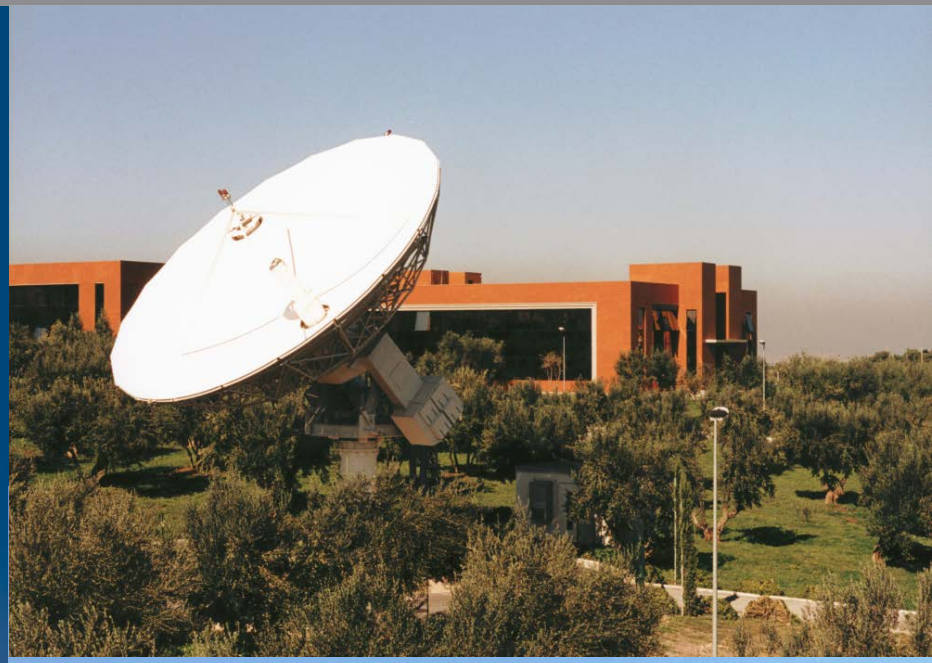
Head of Science, Applications and Future Technologies Department
Directorate of Earth Observation Programmes

Frascati, 5 Oct 2015

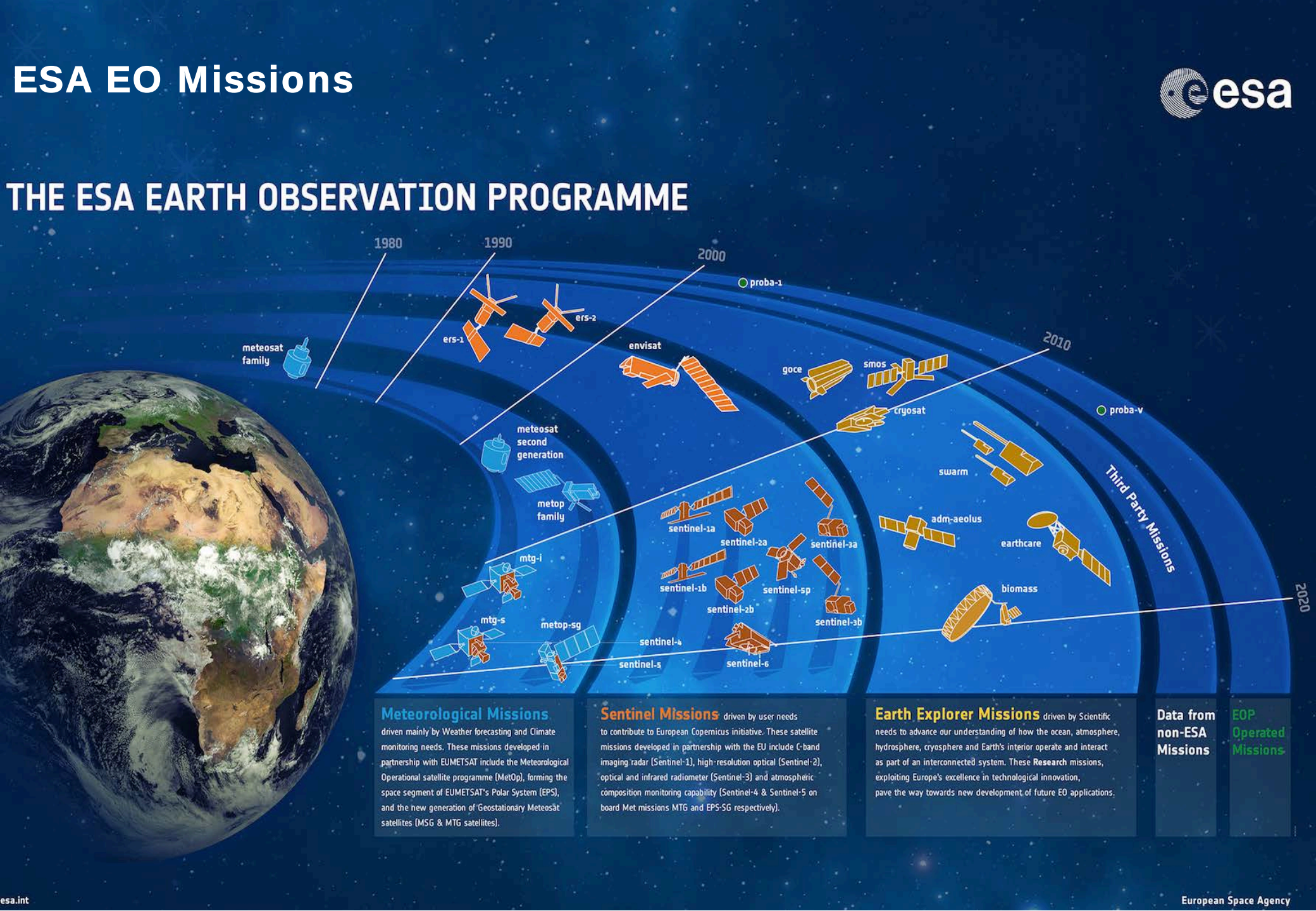
ESRIN – ESA's Earth Observation HQ

Personnel on site: ~ 550

- Payload operations
- EO Data Access (archive)
- EO Data Exploitation and Services
- International Charter for Space and Major Disasters
- User Education & Training
- Communication & Outreach
- Vega Launcher Programme
- ESA IT centre and web portal

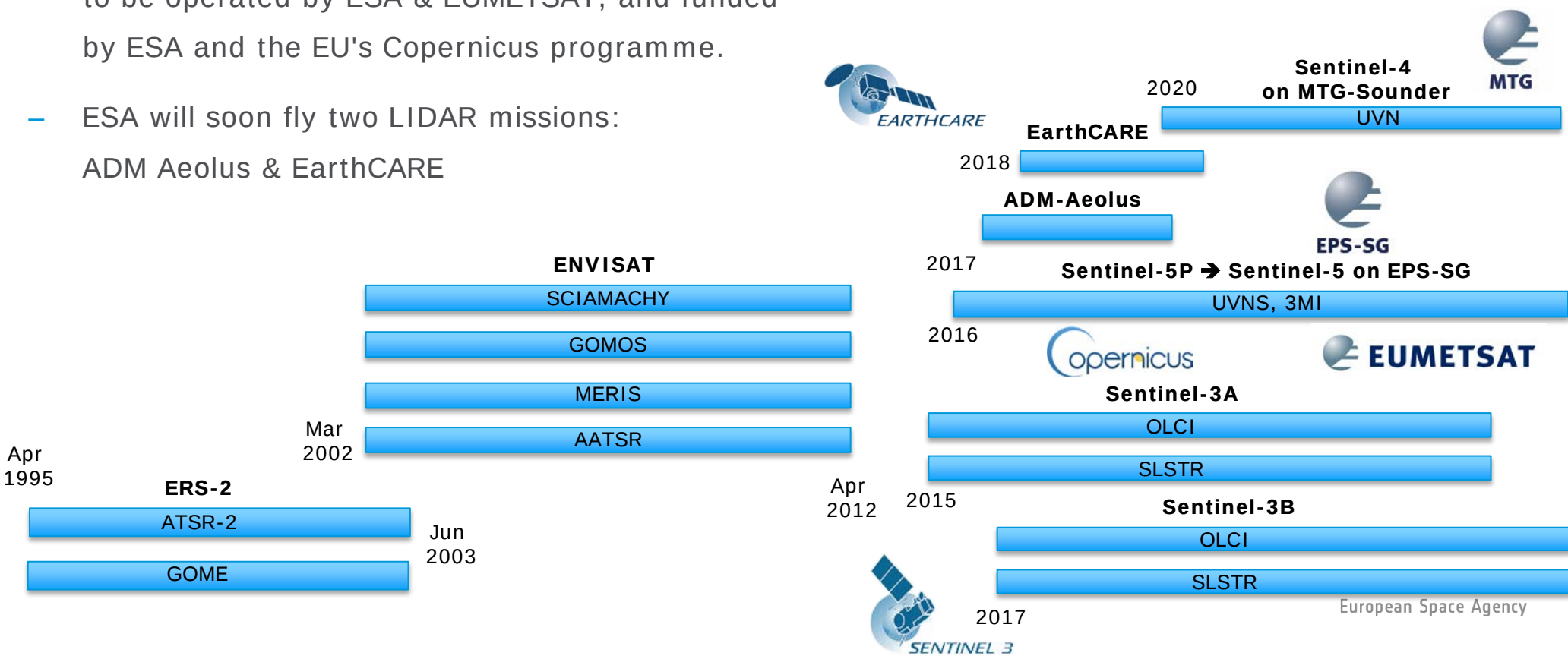


ESA EO Missions



Aerosol Observations from ESA Satellites

- Information about aerosols is retrieved from several past instruments on ERS-2 and Envisat: ATSR-2, AATSR, MERIS, GOME, GOMOS, SCIAMACHY
- Continuity instruments will fly from 2015 onwards on the Sentinel-3, 4 and 5 satellites, to be operated by ESA & EUMETSAT, and funded by ESA and the EU's Copernicus programme.
- ESA will soon fly two LIDAR missions: ADM Aeolus & EarthCARE



ERS-2, Envisat, Sentinel-3

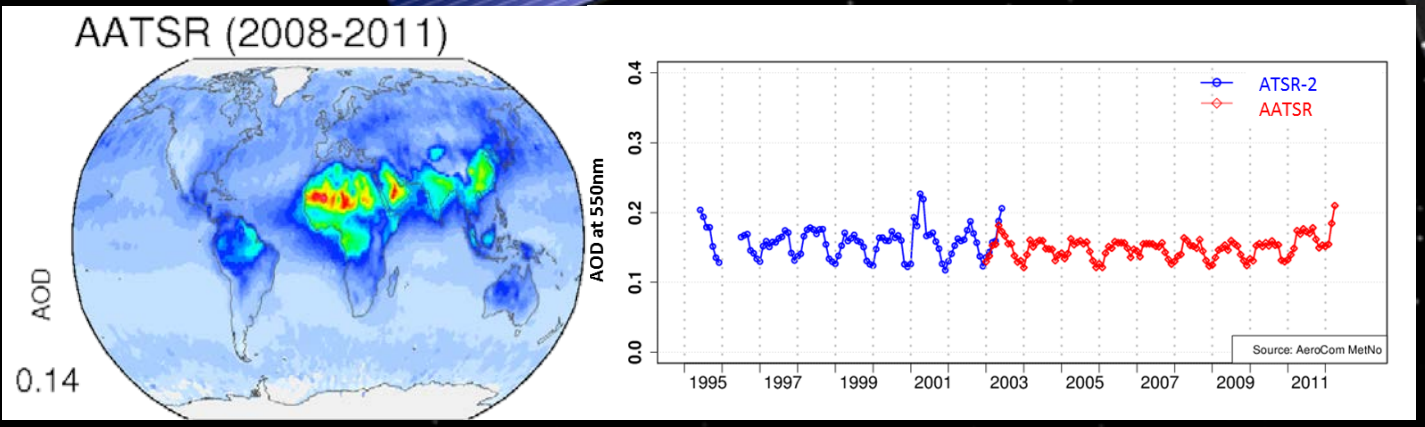
1km global aerosol time series derived from visible & infrared instruments

1995-2012 ATSR-2 and AATSR → 2016+ SLSTR

2002-2012 MERIS → 2016+ OLCI

Data available from the CCI Aerosol project (cci.esa.int)

S-3 launch: 2015



ATSR Aerosol Optical Depth
(Aerosol_CCI/U. Swansea)

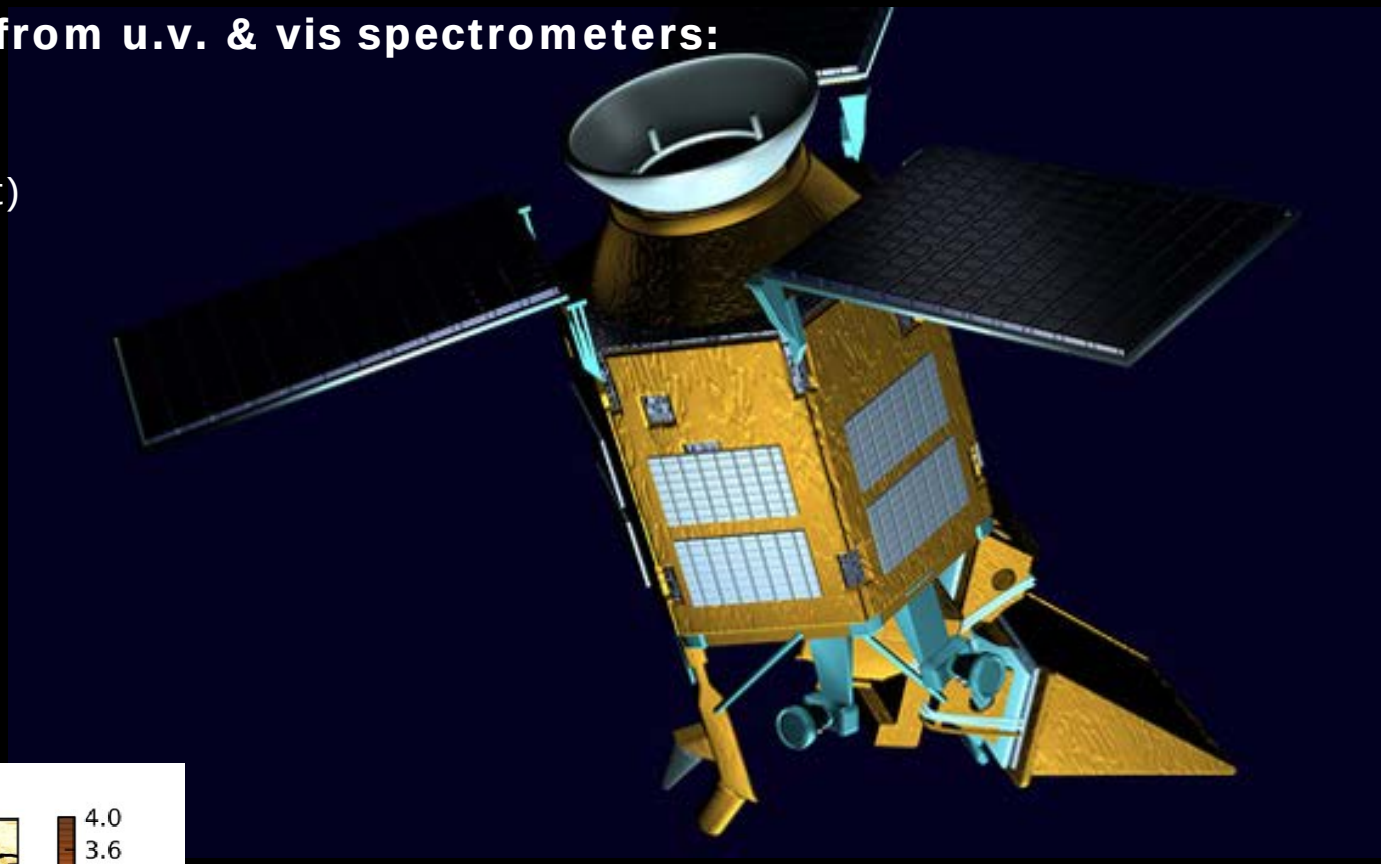
ERS-2, Envisat, OMI, Sentinel-5P

Aerosol time series derived from u.v. & vis spectrometers:

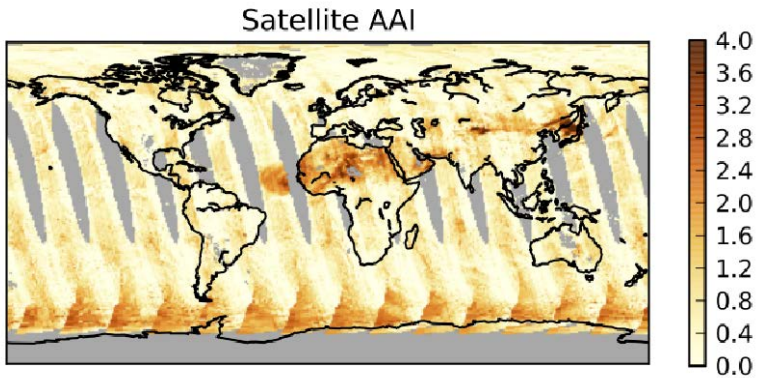
- 1995-2003 GOME (ERS-2)
- 2002-2012 SCIAMACHY (Envisat)
- 2004-2015 OMI (Aura)
- 2017+ Sentinel-5P

Aerosol products:

- Absorbing Aerosol Index
- Aerosol Layer Height (O_2A band)
- Aerosol Type classification



Sentinel-5P launch: 2016



Absorbing Aerosol Index from OMI (KNMI)

ADM Aeolus
Doppler Wind Lidar Mission

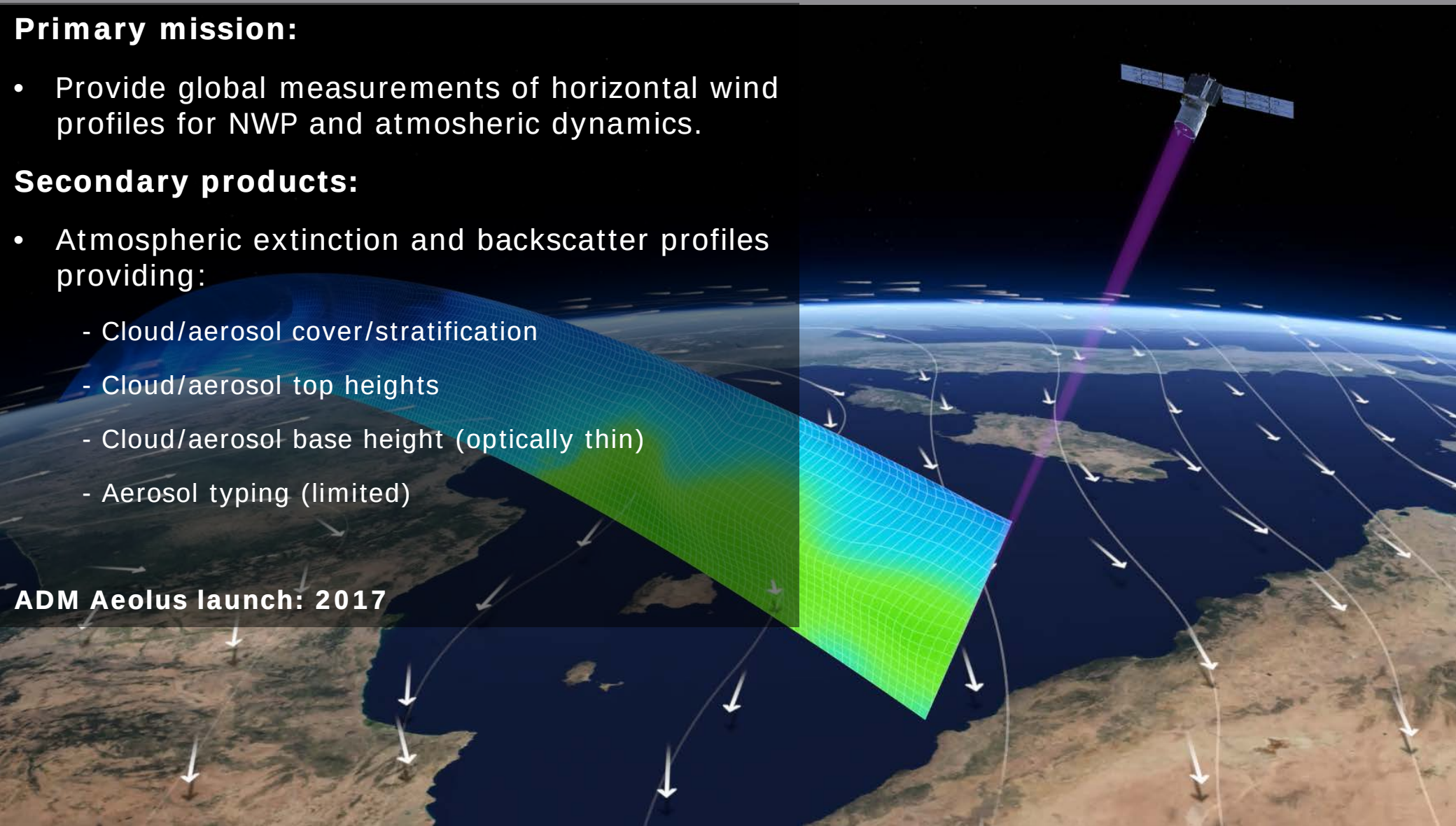
Primary mission:

- Provide global measurements of horizontal wind profiles for NWP and atmosheric dynamics.

Secondary products:

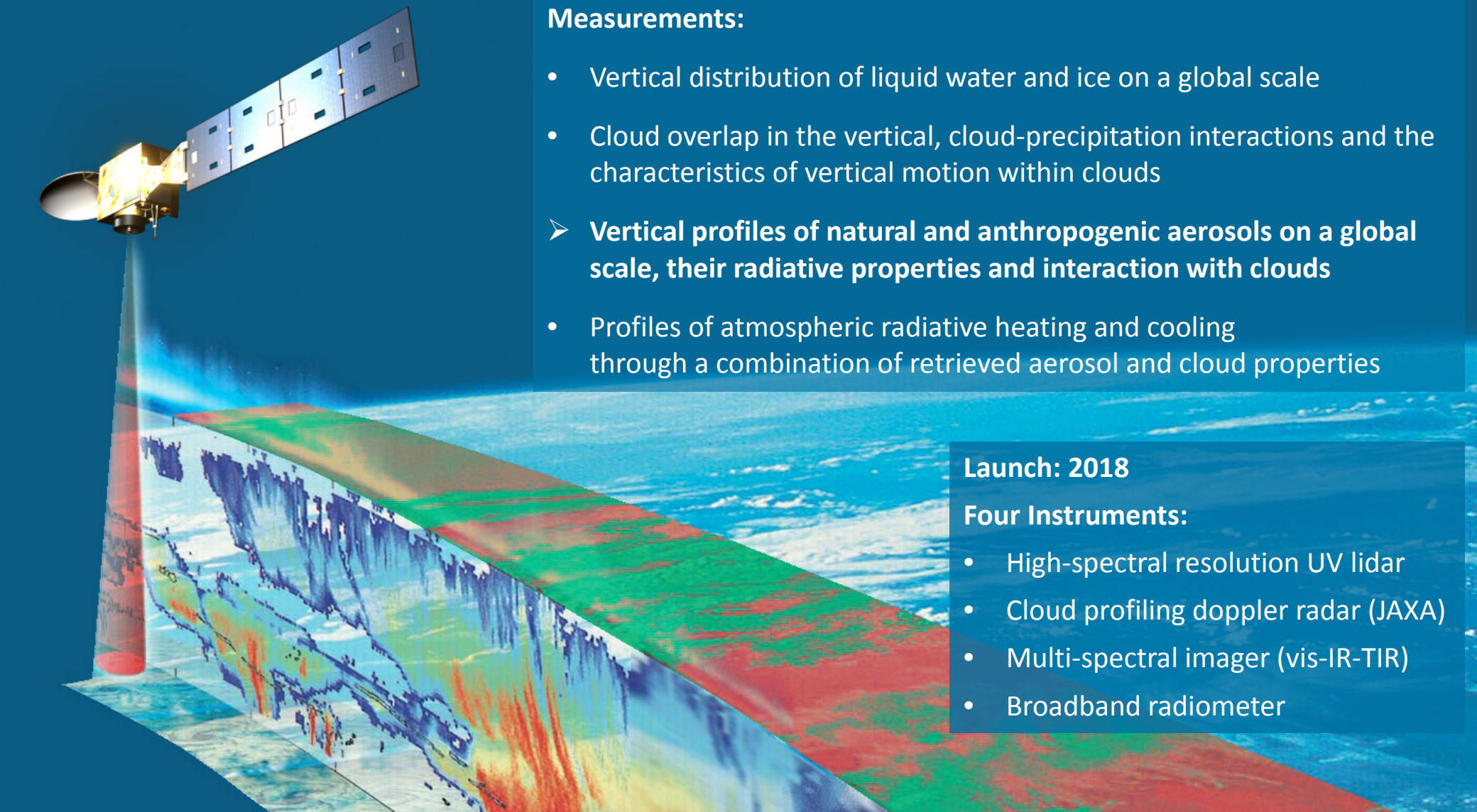
- Atmospheric extinction and backscatter profiles providing:
  - Cloud/aerosol cover/stratification
  - Cloud/aerosol top heights
  - Cloud/aerosol base height (optically thin)
  - Aerosol typing (limited)

ADM Aeolus launch: 2017



EarthCARE

ESA-JAXA Clouds, Aerosol and Radiation Explorer



Measurements:

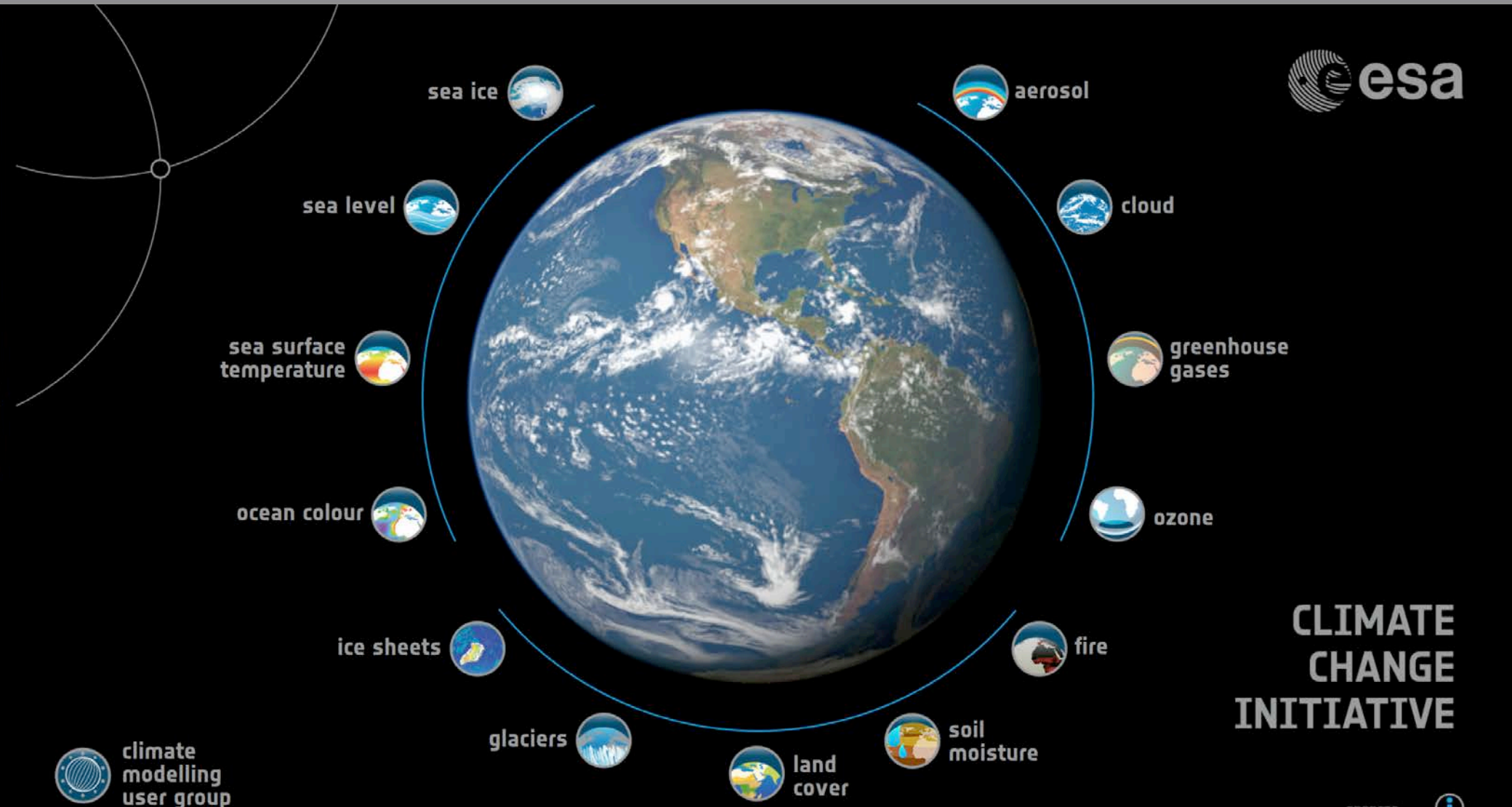
- Vertical distribution of liquid water and ice on a global scale
- Cloud overlap in the vertical, cloud-precipitation interactions and the characteristics of vertical motion within clouds
- ➢ **Vertical profiles of natural and anthropogenic aerosols on a global scale, their radiative properties and interaction with clouds**
- Profiles of atmospheric radiative heating and cooling through a combination of retrieved aerosol and cloud properties

Launch: 2018

Four Instruments:

- High-spectral resolution UV lidar
- Cloud profiling doppler radar (JAXA)
- Multi-spectral imager (vis-IR-TIR)
- Broadband radiometer

ESA's Climate Change Initiative



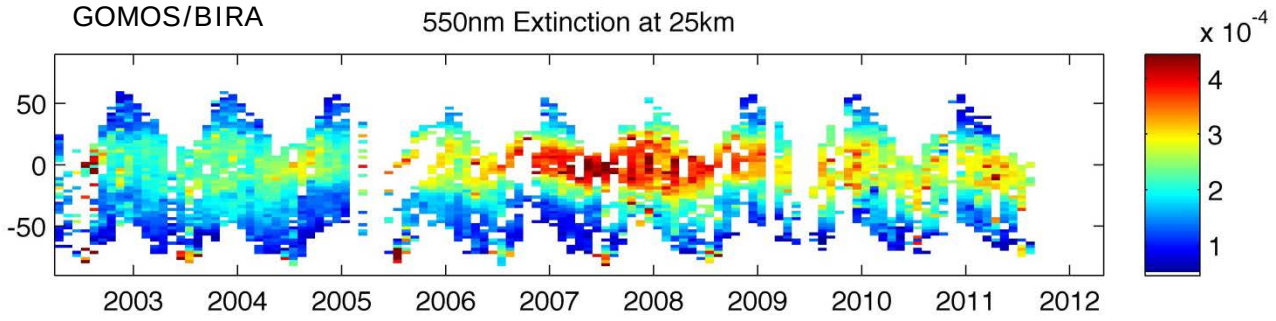
cci.esa.int

CCI Aerosol project
(cci.esa.int)

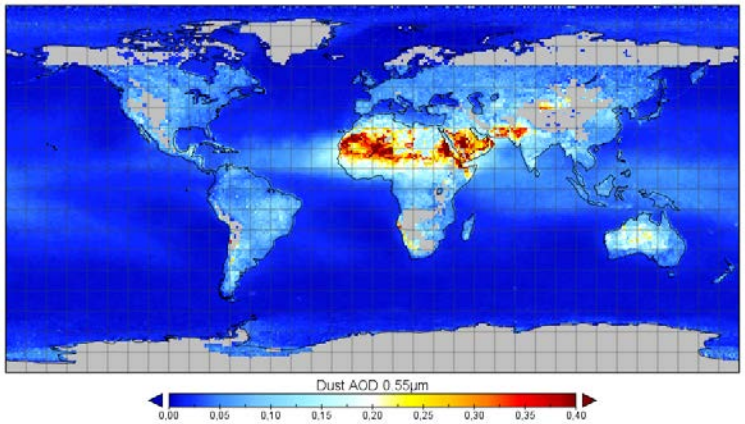
Aerosol_cci is providing aerosol time series from multiple satellite instruments:

- 17yr (1995-2012) AOD at 1km from ATSR-2 and AATSR,
  - to be extended with Sentinel-3 data from 2016+
- 10yr (2002-2012) Aerosol Type information from AATSR + SCIAMACHY
- 10yr (2007-2016) Mineral dust AOD from IASI
- 10yr (2002-2012) Stratospheric aerosol extinction profiles from GOMOS
- 8yr (2005-2012) Aerosol properties (AOD, size, absorption) from PARASOL
  - to be extended with 3MI on Sentinel-5 from ~2021

See presentation by Thomas Popp
on Tuesday afternoon



Mineral Dust AOD (IASI/LMD)



PRAGUE 09-13 MAY 2016

esa

living planet symposium | PRAGUE 09-13 May 2016

Main Objective:
Presentation of Exploitation Results based on ESA Earth Observation Measurements

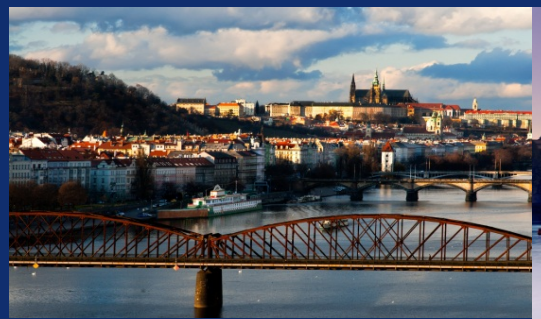
Important Dates:

Deadline for abstract submission	16 October 2015
Notification of Acceptances	January 2016
Issue of Preliminary Programme	February 2016
Opening of Registration to the Symposium	February 2016
Release of the Final Programme	at the symposium
Submission of Full Papers	at the symposium

Themes:

Atmosphere, Oceanography, Cryosphere, Land, Inland Water, Hazards, Climate and Meteorology, Solid Earth/Geodesy, Near-Earth Environment, Methodologies and Products, Open Science 2.0

http://lps16.esa.int



Welcome to AeroCom 2015 at ESA/ESRIN

14th	AeroCom	– Mon, Tue, Thu
1st	CCMI/AerChemMIP	– Wed
3rd	AeroSat	– Thu, Fri

Three meetings in one!

AeroCom

...is an open international initiative of scientists interested in the advancement of the understanding of global aerosol properties and aerosol impacts on climate. A central goal is to more strongly tie and constrain modelling efforts to observational data. **The aim of the annual AeroCom meetings is to encourage exchanges between aerosol data and modeling groups.**

AerChemMIP

...is a joint AeroCom/CCMI contribution to CMIP6. **AerChemMIP is designed to document and understand changes in aerosol and chemical constituents and associated forcings in CMIP6**, in addition to help with providing input fields (e.g. ozone, oxidants, aerosols, nitrogen deposition) to climate models that do not have an explicit representation of atmospheric chemistry or aerosols.

AeroSat

...is an international consortium of aerosol remote sensing scientists. **The aim of the meeting is to accelerate the exchange of ideas and concepts in order to improve the quality of satellite aerosol products**, which are needed to constrain aerosol processing in and assist in evaluations of global modelling.

AeroCom / AerChemMIP / AeroSat ... at ESRIN

By hosting these meetings at ESRIN, we hope to:

1. Raise awareness of the ESA satellite missons providing aerosol observations

2. Support the interaction of the ESA CCI Aerosol project with:

   – the aerosol modelling community (AeroCom/AerChemMIP) to ensure the project responds to aerosol modeller user needs, and to encourage uptake of the CCI Aerosol products by modellers.

   – the international satellite aerosol community (AeroSat) to facilitate exchanges on best practice in aerosol retrieval techniques in order to provide the best quality aerosol observational data sets from ESA satellite missions.