SeaWiFS and Meteosat aerosol products

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SeaWiFS sensor

- Ocean color sensor (ORBIMAGE/NASA)
- Launched in August 1997
- Data available since october 1997
- Not operated after December 2003
- 8 spectral bands (412, 443, 490, 510, 565, 670, 765 and 865 nm)
- Spatial resolution of 4 km (L1 GAC)
- Swath of about 1100 km (L1 GAC)

SeaWiFS Level-1 data

- 19 MB/orbit, 14.5 orbit/day (277 MB/day; 100 GB/year)
- Easy to get using the NASA/GSFC/DAAC
- Easy and fast to process using the SeaDAS software
- Accurate calibration of all bands

The « perfect » dataset for radiance assimilation within global models (accurate, simple, small,…)

SeaWiFS Level-3 products

- Daily, 8-day and monthly products
- 9 km resolution
- HDF format
- 2 types of L3 products:
  - « Binned Data » product
  - « Standard Mapped Image » product

Both products contain aerosol optical thickness and Angström exponent over oceans, but only the « Binned Data product » is OK !!!

SeaWiFS Level-3 Binned Data product

- About 50 MB per day
- Aerosol optical thickness and Angström exponent come from the « atmospheric correction » algorithm:
  - Optical thickness > 0.35 are removed
  - Simplified set of aerosol models (Shettle and Fenn)

SeaWiFS Level-3 products are interesting (6 years of global daily data), but provide very basic information on aerosol properties

Meteosat sensors

- Series of geostationnary sensors
- Continuous observation since 1979 (Meteosat-1 to -7)
- Data not available before 1983
- One single wide spectral band in the VIS/NIR (0.35-1.1 µm)
- 5 km resolution
- One image every 30 mn

Meteosat aerosol products

- No standard aerosol product (only radiances)
- Meteosat VIS band does not allow accurate aerosol optical thickness retrievals and does not provide any information on aerosol properties

Meteosat has been used to monitor African dust optical thickness. A complete reprocessing of the full resolution archive should be performed at the ICARE center.

Meteosat Second Generation

- MSG is a « super-Meteosat » that will allow more accurate aerosol studies:
  - 3 spectral bands in the VIS-NIR at 0.67, 0.8 and 1.6 µm)
  - One image every 15 mn
  - 2.5 km resolution
- MSG was launched in August 2002 and calibrated data should be available in October 2003
- Still no standard aerosol product
- LSCE is responsible for the development of the aerosol algorithm over oceans.

Conclusions

- The SeaWiFS archive should be more considered by the aerosol community
- In the framework of AEROCOM, SeaWiFS Level-3 aerosol product may be of interest despites its limitations
- The Meteosat archive is OK for mineral dust only.
- MSG is promising but will perhaps be late for AEROCOM