Aerosol products from GOME-2 on the Metop-A satellite: first impression

L.G. Tilstra¹, O.N.E. Tuinder¹, O.P. Hasekamp², M. de Graaf³ and P. Stammes¹

¹Climate Research and Seismology Department, Royal Netherlands Meteorological Institute (KNMI), Wilhelminalaan 10, 3732 GK, De Bilt, The Netherlands
²Earth Oriented Science Division, Netherlands Institute for Space Research (SRON), Sorbonnelaan 2, 3584 CA, Utrecht, The Netherlands

Keywords: aerosol detection, satellites, remote sensing

In the framework of the O3MSAF (Satellite Application Facility on Ozone and Atmospheric Chemistry Monitoring) of EUMETSAT we produce two aerosol products from observations of the satellite instrument Global Ozone Monitoring Experiment (GOME-2) onboard Metop-A (Callies et al., 2000). From the Earth reflectances measured at 340 and 380 nm we calculate the Absorbing Aerosol Index (AAI), which is an index that indicates the presence of UV-absorbing aerosols like desert dust or smoke. The AAI is capable of detecting aerosols over land and sea surfaces, even in the presence of clouds when the absorbing aerosol layer overlies the cloud.

As a reference, we can make use of the AAI determined from satellite measurements taken by the spectrometer SCIAMACHY onboard the Envisat satellite. The SCIAMACHY AAI is available since July 2002 and can serve as a very reliable reference (Tilstra et al., 2007). Also see Figure 1. The aerosol plumes seen in this picture are desert dust and biomass burning aerosols. By focusing on specific regions, and inspection of time series of the AAI, we can validate the GOME-2 AAI by direct comparison with the SCIAMACHY AAI. In this way, we will be able to report on the quality of the GOME-2 AAI.

The second aerosol product we produce is the Aerosol Optical Thickness (AOT). For this product, we make use of the polarisation measurements that are performed by GOME-2. Special Polarisation Measurement Devices (PMDs) are available onboard, measuring both components of the incoming radiation. Information about the polarisation of the detected radiation can be used to detect the microphysical characteristics of aerosols. The AOT currently has an experimental status. We will report on the status of both GOME-2 aerosol products.

References:


Figure 1. Global monthly aerosol distribution for September 2007, according to the Absorbing Aerosol Index (AAI) measured by the satellite instrument SCIAMACHY onboard the Envisat satellite. Only positive AAI values are shown. They are indicative of the presence of (UV-absorbing) aerosols.