



Comparison between the AOD derived from a global climate model HadGEM2 and from satellite observations

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Aerosol optical properties define the radiative balance of atmosphere. Aerosol optical depth (AOD) describes quantitatively the column-integrated extinction of solar light caused by atmospheric aerosols. Climate models, such as HadGEM2 (1), developed by the Met Office Hadley Centre, provide a simulated estimate of monthly AOD. In this study the monthly global AODs obtained from HadGEM2 are compared with monthly aggregate AODs derived from two different satellite instruments, AATSR (2) and MODIS (3). AATSR (Advanced Along Track Scanning Radiometer) is onboard ESA's ENVISAT (ENVIRONMENTAL SATellite), which covers the globe in 3-5 days (4). MODIS (Moderate Resolution Imaging Spectrometer) is onboard NASA satellite Terra, which covers the globe in 1 or 2 days.

The accuracy of the three AOD products is also evaluated by using ground based AOD measurements provided by AERONET (AEROSOL ROBOTIC NETWORK) (4). Several stations are used in this study, each representing different type of environment in terms of e.g. surface reflectance and aerosol load.

Preliminary results show that the largest difference between HadGEM2 and satellite observations is seen over regions with high surface reflectance, however these areas are known to be problematic for both MODIS and AATSR. Large differences are also seen over regions with wide areas of green vegetation. In general satellite retrieved AODs are in good agreement with each other.

(1) <http://www.metoffice.gov.uk/research/modelling-systems/unified-model/climate-models/hadgem2>

(2) <http://earth.eo.esa.int/pes/envisat/aatsr/reports/cyclic>

(3) <http://modis-gsfc.nasa.gov>

(4) <http://aeronet.gsfc.nasa.gov>