



## **An intercomparison study of ground-based aerosol optical depth with satellite retrievals over Mace Head and the north eastern Atlantic region**

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The principal objective of this work is to validate satellite retrieved aerosol optical depth data with continuous ground-based measurements being made at the Mace Head atmospheric research station on the west coast of Ireland.

Retrieval of aerosol parameters is currently being investigated using the BAER (Bremen AEROSOL Retrieval) technique developed by the IUP/FE, at the University of Bremen, Germany (von Hoyningen-Huene et al, 2003). The BAER procedure uses the raw radiance data (Level-1A) from the Sea-viewing Wide Field-of-view Sensor (SeaWiFS) to retrieve aerosol optical depth (AOD) over both land (in the UV and near-UV range) and over ocean (using also the near infra-red channels) surfaces. Ground-based optical depth is provided by a Precision Filter Radiometer at the Mace Head site, measuring AOD at four wavelengths centred at 862, 500, 412 and 368 nm. Due to high levels of cloud cover over the region of interest, additional satellite data is provided by Level-2 MODERate Resolution Imaging Spectrometer (MODIS) aerosol products. The validation work is a feasibility study to assess the possibility of synergistically using SeaWiFS and MODIS data together in order to monitor the high spatial and temporal variability of aerosols and their sources over Ireland and the north eastern Atlantic region. Data corresponding to periods of high pressure from April to October 2003 have been selected. Such anticyclonic conditions are suitable for measuring polluted air masses at Mace Head, the sources of which mainly originate in the UK and mainland Europe. The presented results from this validation represent the initial stage

in the future planned application of satellite aerosol retrievals in this region, which is the quantification of the import and export of polluted aerosol plumes into and out of Ireland.

**References:**

1. von Hoyningen-Huene, W., M. Freitag and J. P. Burrows, Retrieval of aerosol optical thickness over land surfaces from top-of-atmosphere radiance, J. Geophys. Res., 108 (D9), 4260, 2003.