Geophysical Research Abstracts
Vol. 16, EGU2014-15523, 2014
EGU General Assembly 2014

Evaluation of GOMOS stratospheric aerosol extinction profiles using data from the NDACC LIDAR and satellites (CALIOP, OSIRIS, SAGE-III)

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In the framework of the ESA AEROSOL Climate Change Initiative (CCI) stratospheric aerosol optical density (AOD) and extinction profiles were provided, based on the AERGOM algorithm, a new aerosol retrieval algorithm developed for GOMOS. AERGOM has been applied to the GOMOS residual extinction data in the release v6.01. The level 3 data consists of monthly averaged extinction products, provided at 550 nm on a 2.5° latitude x 10° longitude grid for the year 2008. In addition, data from other years are used. The aim of this study was to validate the stratospheric aerosol product by comparison with ground-based LIDAR and satellite data.

We show comparisons with LIDAR data from the NDACC network. For the year 2008 the NDACC database contain aerosol LIDAR data from ten stations, matches with GOMOS are found for eight sites and these were used for validation. The comparison is very encouraging, but the result obtained so far is not statistically significant yet, therefore analysis using data from additional years will be added. Further, we use monthly gridded stratospheric extinction datasets for 2008 from CALIOP and OSIRIS for comparison. Data from SAGE-III for previous years are used for a general evaluation.

The eruption of Kasatochi volcano in August 2008 led to an increase of stratospheric aerosol over the Northern hemisphere. Especially in the Arctic where summertime AOD are usually low ($\sim$0.05 monthly mean for Spitsbergen), the stratospheric aerosol loading of such events is an important contribution to the total aerosol loading, which has to be taken into account in climate modelling. The evolution of the volcanic aerosol layer during autumn 2008 are captured by the GOMOS zonal mean extinctions.

A comparison of GOMOS monthly means stratospheric AOD in 2008 with OSIRIS data (converting the OSIRIS extinction at 750 nm to 550 nm using the multi-wavelenghts information from GOMOS) show reasonable good agreements. The CALIOP data seems to have slightly higher values compared to GOMOS. We will extend our analysis to different years and stations to better characterize the variability between these datasets.