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## Climate Data Records of GOMOS/AerGOM stratospheric aerosol extinction coefficient for the Copernicus Climate Change Service: last developments and validation

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Stratospheric aerosol extinction coefficient data derived from GOMOS using the AerGOM algorithm are one of the aerosol products provided to the Copernicus Climate Change Services (C3S).

The stellar occultation instrument GOMOS, which sounded the atmosphere in the UV-visible-near IR range on board ENVISAT during the period 2002-2012 was a pioneering instrument, relying on a large number of stars with varying magnitude and temperature making the data inversion challenging. An algorithm called AerGOM was developed as an alternative to the operational algorithm to optimize the retrieval of aerosol properties, and this dataset has been continuously improved since then.

A main milestone of this evolution was the elaboration of Level 3 gridded datasets in the framework of the ESA Aerosol\_CCI project. This dataset provides aerosol radiative properties with as main quantity the aerosol extinction coefficient between 350 and 750 nm with a better resolution (bins with 5° latitude and 60° longitude intervals, 5-day time periods) than the usual monthly zonal mean. It is therefore better suited to describe the signature of events such as medium-size volcanic eruptions.

Afterward, an extended exploration of the AerGOM performance in the retrieval of trace gases such as ozone, nitrogen dioxide and nitrogen trioxide led to an adaptation of the retrieval scheme in order to improve the retrieved gaseous species.

The outcome of this exploration performed in the framework of the ESA Living Planet project EXPANSION is now exploited to improve again the Level 2 aerosol extinction coefficient, and the resultant Climate Data Record (CDR) delivered to C3S.

We present here the latest developments in the aerosol extinction coefficient retrieval from GOMOS using AerGOM, and show how we use the improvement of the inversion of gas species to derive the new version of the GOMOS extinction product in Level 2, and the C3S CDR. The validation of the AerGOM dataset with respect to datasets from several contemporary missions such as SAGE II, SAGE III, and OSIRIS is also presented.

