Contribution ID: **43** Type: **Talk**

Aerosol extinction coefficients retrieved from OMPS limb scattering observations: Tackling the differences between three data products (NASA, USASK, UB)

Due to its long time series and dense spatial coverage, the aerosol extinction coefficient (Ext) obtained from OMPS limb scattering observations is a valuable data record for observing the temporal aerosol evolution in the stratosphere after strong volcanic eruptions and wildfires. The OMPS limb scattering data set is a promising candidate for use in GLOSSAC and already used in CREST climate data record. Three OMPS data sets are currently available, retrieved by algorithms from NASA, the University of Saskatoon (USASK) and the University of Bremen (UB). Each algorithm is individual, the single algorithm specifications imply various advantages for the retrieved Ext. Accordingly, each retrieval algorithm provides good results but there are certain differences between the Ext products from NASA, USASK, and UB, especially in regions where retrievals are highly challenging: During strong aerosol perturbations following volcanic eruptions and wildfires, the upper troposphere-lower stratosphere (UTLS) region, and in the southern extratropics. The intercomparison of all three OMPS Ext products provides the potential to understand the causes for these differences. Independent data from SAGE III/ISS and balloon-borne observations are used as a reference in this study. Impacts of the assumption of a particle size distribution (PSD), the surface albedo, the single scattering angle, and the tangent height normalization on the retrieved OMPS Ext are studied. The strongest driver for the differences between the OMPS data sets is the PSD assumption. It can explain the different magnitudes of Ext in volcanic/wildfire plumes, different saisonalities, and even affects the impact of the surface albedo. Understanding the causes of the differences between the Ext products helps to correctly evaluate and analyze the comparison of the OMPS Ext with other data products. It also supports the improvement of the retrieval algorithms. If more accurate satellite data products can be made available, they will be of a great importance for use in GLOSSAC and CREST, the essential input data records for global climate simulations.

Topic

Current and past limb and occultation instruments: algorithms, products, validation

Author: POHL, Christine (Institute of Environmental Studies, University of Bremen, Germany)

Co-authors: ROZANOV, Alexei (Institute of Environmental Studies, University of Bremen, Germany); TAHA, Ghassan (NASA Goddard Space Flight Center, Greenbelt, Maryland USA); RIEGER, Landon (Environment and Climate Change Canada); BOURASSA, Adam (Institute of Space and Atmospheric Studies, University of Saskatchewan, Canada); VERNIER, Jean-Paul (National Institute of Aerospace Associates, Hampton, Virginia, USA); DESHLER, Terry (Department of Atmospheric Science, University of Wyoming, Laramie, Wyoming, USA); KOVILAKAM, Mahesh (NASA Langley Research Center, Hampton, Virginia, USA); THOMASON, Larry (NASA Langley Research Center, Hampton, Virginia, USA); DUCHAMP, Clair (Laboratoire de Météorologie Dynamique, Institut Pierre Simon Laplace, Paris, France); LEGRAS, Bernard (Laboratoire de Météorologie Dynamique, Institut Pierre Simon Laplace, Paris, France); VON HOBE, Marc (Institute for Energy and Climate Research, Forschungszentrum Jülich GmbH, Jülich, Germany)

Presenter: POHL, Christine (Institute of Environmental Studies, University of Bremen, Germany)