



Contribution ID: 63

Type: Talk

Ozone Profile Retrievals from Suomi NPP and NOAA-21 OMPS Limb Profilers: Operational Status and Improvements

The Limb Profiler (LP) is a limb-scattering sensor that is part of the Ozone Mapping and Profiler Suite (OMPS). The first OMPS LP onboard the Suomi NPP satellite has been operational for over 13 years, since 2012, while the second LP onboard the NOAA-21 satellite began observations in February 2023. In this study, we provide updates on the operational status of both LPs and offer an overview of some algorithmic and operational changes. Measurements from both LPs have been processed using the same retrieval algorithm (version 2.6), which combines measurements from the UV and VIS regions of the spectrum to retrieve a single vertical ozone profile between 12.5 km (or cloud tops) and 57.5 km. We will discuss ongoing improvements aimed at enhancing ozone retrievals in the lower stratosphere, including updates to the new aerosol correction scheme. The Suomi NPP satellite experienced several GPS anomalies in 2024, which affected the pointing of the LP instrument and resulted in ozone anomalies. As a result, we have not released data from the Suomi NPP OMPS during this period of GPS anomalies. We will also discuss changes in the retrieved ozone, related to variations in ancillary meteorological data, such as pressure and temperature, which are necessary for the radiative transfer calculations.

Finally, we present comparisons between the two OMPS LPs and provide an assessment of the associated uncertainty budget.

Topic

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

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