(3-240320-C) **Ground-based Validation of the NOAA-20 NUCAPS and OMPS Ozone Profiles for Trends.**

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Over the last 40 years, NOAA GML continuously collected, calibrated, and quality-assured ground-based (GB) and in situ ozone and water vapor vertical profile observations. These datasets provide a reference for the operational products collected by the Ozone Mapping and Profiler Suite (OMPS) and Cross-Track Infrared Sounder (CrIS) instruments flying on Suomi NPP, NOAA-20, and NOAA-21 satellites as part of the Joint Polar Satellite Systems (JPSS) for tracking daily changes in atmosphere, oceans and land.

The NOAA Unique Combined Atmospheric Processing System (NUCAPS) provides operational retrievals of ozone and water vapor profile based on the hyperspectral infrared sounding instruments, including CrIS instrument aboard the Joint Polar Satellite System (JPSS), and the Infrared Atmospheric Sounder (IASI) aboard the Meteorological Operational Satellite Program (MetOp). The latest NUCAPS retrievals use the updated trace gas climatological a priori profiles and provide information about uncertainties of the retrievals. The ozone Averaging Kernels are available for comparisons with high vertical resolution profiles, i.e. in-situ ozonesonde observations. The NOAA OMPS instrument operationally produces ozone profiles and ozone column data daily and globally. The NOAA GML ground-based observations are used to assure the stability of ozone satellite records and in support of the combined long-term global satellite records (i.e. COHesive ozone record) which are important for climate research and predictability of the future Earth.

This presentation provides an evaluation of temporal stability and geographical biases of the JPSS S-NPP, NOAA-20, NOAA-21 NUCAPS and OMPS operational ozone products against the NOAA ground-based ozonesonde and Dobson observations. We use station overpass data and the NUCAPS satellite AKs to analyze the improvements in tracking the Antarctic ozone hole during the spring to summer transition, as well as ozone variability over mid-latitudes and tropical regions. The ultimate goal is to assess the long-term stability of satellite records for contributing to climate records and trend analyses.

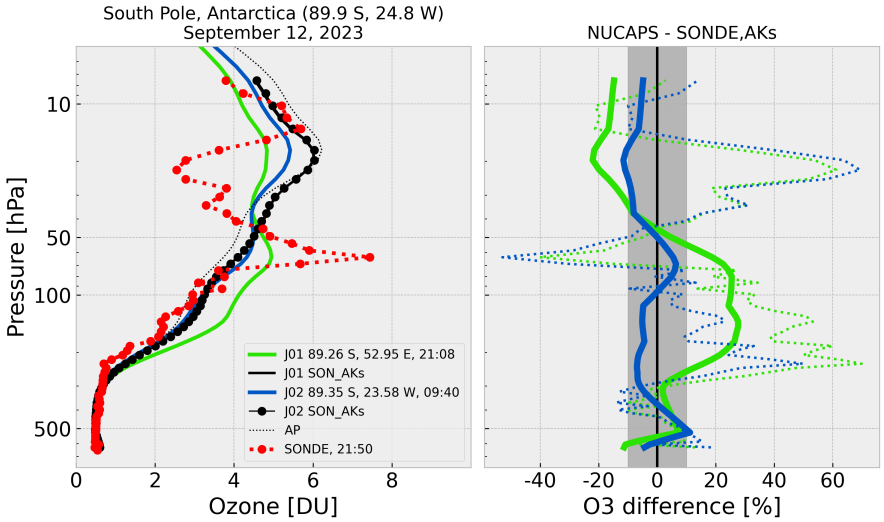

Figure 1. Left) JPSS-1 (green) and JPSS-2 (blue) satellite NUCAPS ozone (DU) near the South Pole vs. ozonesonde profile (09/12/23). Ozonesonde proifles are integrated in 100 layers (red dots) or smoothed with respective AKs (black solid and dotted lines). A priori (climatology) profile is shown as dotted line. Right) Difference (%) between NUCAPS profiles and integrated ozonesonde (dashed lines) or AK-smoothed ozonesonde profile (solid lines).