(23-240328-A) **Total Ozone and Ultraviolet Radiation Measurements at the South Pole**

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Total column ozone (TCO) and ultraviolet (UV) radiation have been measured at the South Pole with a SUV-100 spectroradiometer of NOAA's Antarctic UV Monitoring Network since 1990. Retrievals of TCO take the actual profiles of temperature and ozone into account. Operational data are based on the Bass & Paur ozone absorption cross section ($O_3$CS) but agree with data processed with the now-recommended $O_3$CS by Serdyuchenko & Gorshelev to within 0.25%, 0.5%, and 1.0% for solar zenith angles <80°, <85° and <89°, respectively. TCO data are compared with two datasets of the collocated Dobson spectrometer and satellite data from TOMS (Nimbus7, Meteor3 and Earth Probe), OMI, OMPS and TROPOMI. On average, SUV-100 TCO data exceed other TCO data by 2.5% (Dobson, temperature corrected), 1.6% (Dobson, operational), 2.0% (OMPS), 2.1% (TOMS Earth Probe), and 1.8% (OMI), but are not biased against TROPOMI data. The change in the ratio of SUV-100 and Dobson measurements is smaller than 0.078±0.101% per decade, indicating that there is no significant drift between the two datasets. Ratios of SUV-100 and the other TCO datasets were also analyzed as a function of airmass. Ratios for temperature-corrected Dobson data depend less on airmass than ratios for uncorrected data, confirming that correcting Dobson data for seasonal differences in stratospheric temperature increases their accuracy. SUV-100 data are available at a higher temporal resolution than Dobson data (Figure 1). We found no statistically significant trends in monthly average TCO between 1996 and 2023 for the months of October through February for any dataset spanning this period.

Figure 2 shows measurements of the UV Index (a measure of erythemal or "sunburning" UV radiation) derived from the measurements of the SUV-100. Between 2018 and 2022, the UV Index varied greatly in the austral spring due to variations in the depth and size of the Antarctic ozone hole. Between October and mid-November, the UV Index was at the minimum of the historical (1991–2017) range in 2019 but near the maximum of this range in 2020, 2021, and 2022. (2023 data are not yet available but will be added in time of the conference). Because of the high UV levels in recent years, UV data do not yet indicate that the Antarctic ozone layer is recovering.

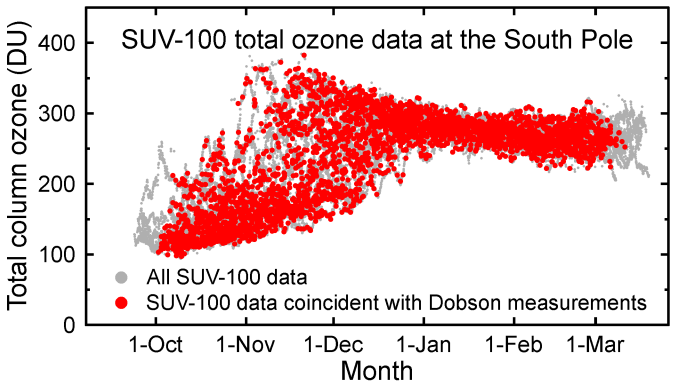


**Figure 1.** Total column ozone measured by the SUV-100 spectroradiometer at the South Pole between 1990 and 2023.

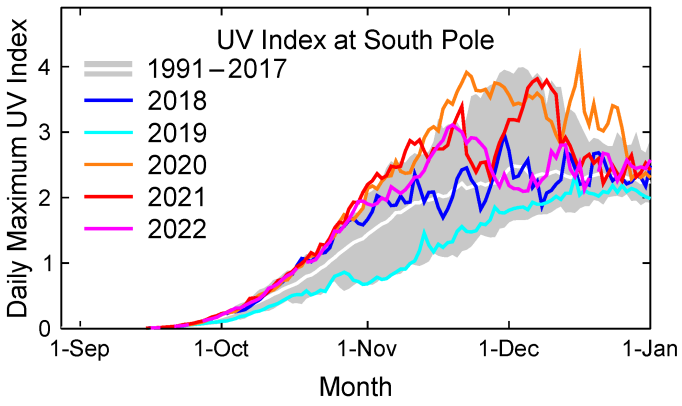


**Figure 2.** The daily maximum UV Index measured at the South Pole by the SUV-100 spectroradiometer. Average (white) and range (grey) of the years 1991–2017 are compared with data of the years 2018–2022.