

1. Seasonal, interannual, and vertical structure of stratospheric ozone at Mauna Loa Observatory, Hawaii (19.5°N, 155.6°W).

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4. Abstract

Using more than 800 profiles obtained by the DIAL-ozone lidar of the Jet Propulsion Laboratory (JPL) at the Mauna Loa Observatory (MLO), Hawaii, a wide range of temporal variability of stratospheric ozone is investigated. High-resolution vertical profiles of ozone number density between 15-50 km are routinely obtained several nights a week since July 1993 as part of the Network for the Detection of Stratospheric Change (NDSC). The observed seasonal, interannual, and vertical structure of stratospheric ozone, typical of a low solar activity period (1993-1999), is presented. As expected for tropical latitudes the ozone concentration tends to be higher during the summer months and lower during the winter months throughout the entire stratospheric ozone layer. Still a weak signature of the extra-tropical latitudes consisting in a secondary maximum in late winter can be observed near 19-20 km. Since MLO is located in either side of the so-called subtropical transport barrier, this signature is believed to be related to the intrusion ozone-rich air masses from the midlatitude lower stratosphere which is especially frequent in spring following the final breakdown of the winter polar vortex. Some large day-to-day variability has also been observed in the lowermost stratospheric levels. Its connection with the variability of the tropical tropopause pressure or height will be examined. Finally, the ozone interannual variability including the signatures of the Quasi-Biennial Oscillation (QBO), and the El Nino and the Southern Oscillation (ENSO) will be investigated.

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5. Topic: (1) Observations and analyses of total and vertical ozone distributions.

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