

#### **4.088 Characterization of ozone in the middle troposphere over Japan from 6-year observation at the summit of Mount Fuji (3776m).**

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Abstract:

The continuous measurement of tropospheric ozone was made at the summit of Mt. Fuji (3776 m a.s.l.) for 6 years (1992-1998). The observations suggest some characteristic features of ozone in the middle troposphere over Japan. The annual variation at the summit of Mt. Fuji shows a bimodal seasonal trend; May and October maxima and August and December minima. The summer minimum, which causes the bimodal seasonal trend, is resulted from the domination of the ozone-depleted maritime air at the summit. In June, however, the enhanced ozone (>60 ppbv) is occasionally observed at the summit in the air with low water-vapor mixing ratio and high potential vorticity (PV), suggesting that it has origins in the stratosphere or the upper troposphere. The small variance of ozone during the winter is suggested by the winter photochemistry on ozone and strong zonal winds. The infrequent ozone intrusions from the stratosphere are also thought to contribute to the small variance of ozone during the winter. The synchronization of the annual course of daily-mean ozone with the clear-sky solar radiation at the summit from late autumn to early spring and the coincident of the both minima in late December suggest that the solar radiation controls ozone observed at the summit during this period of time. In the spring, the daily-mean ozone simultaneously increases with the daily solar radiation besides the ozone concentrations do not correlate with PV, suggesting that the spring ozone maximum at the summit of Mt. Fuji is mainly resulted from photochemical ozone production. However, the possibility of partial contribution of indirect stratospheric ozone intrusions or aged stratospheric ozone to the spring ozone maximum cannot be ruled out. The 6-year observation of ozone at the summit shows the increase trend of  $0.49 \text{ ppbv year}^{-1}$ , but it is not significant at 95% significance level.