Abstract Submitted
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Lamination in Atmospheric Ozone: A Diagnostic for Tracer Transport Mechanisms KENNETH MINSCHWANER, Department of Physics, New Mexico Institute of Mining and Technology, GLORIA MANNEY, NorthWest Research Associates, LUIS TORRES, Department of Physics, New Mexico Institute of Mining and Technology — An understanding of ozone variability in the upper troposphere (from ∼5 km altitude up to the tropopause level) is critical to assessing the radiative forcing of climate by ozone, and for evaluating the impact of transport on regional air quality. Part of this variability arises in fine-layered (∼0.2 to ∼2 km) structures seen in vertical profile measurements of ozone. These laminae are also generally limited on horizontal scales (10's to 100's of km), leading to spatial ozone variability observed on quasi-horizontal coordinate surfaces. Given the relatively long photochemical time constants for ozone in the upper troposphere, most of the observed variability arises from transport rather than photochemistry. There are a wide range of dynamical processes that can generate ozone laminae in the upper troposphere, such as gravity and Rossby waves, convective lofting and detrainment of either high or low ozone amounts from the boundary layer, and intrusions of air masses with high ozone concentrations from the stratosphere. Here, we examine the range of observed laminae characteristics and describe methods for tracing the origins of tropospheric ozone laminae.

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