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Large-scale variability of ozone in the stratosphere

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Variability of ozone field depends on the scale at which the phenomena are considered. This work is dedicated to ozone variability within a month and in 10° latitude zones, which we refer to as large-scale variability (or climatological variability).

We use ozone profiles by MIPAS (Michelson Interferometer for Passive Atmospheric Sounding) and MLS (Microwave Limb Sounder) for detecting spatio-temporal large-scale ozone variability. Realistic data uncertainty estimates and dense sampling allow accurate estimates of ozone variability. We compare our results with previous estimates of climatologic ozone variability and study its evolution with time vs evolution of ozone itself (trends).

The information about ozone variability can be used in retrievals from satellite measurements that use a priori information in the form of Bayesian statistical optimization (this is especially important for ozone profile retrievals from nadir-looking instruments) and for characterization of uncertainties due to non-uniform spatio-temporal sampling.