Idea378

Features of variability of ozone in polar regions.

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Aim. Study of variability of column abundance and vertical distribution of ozone in polar regions at different time scales: day-to-day variability, the annual variation, quasi-biennial variations, effects of El Nino, effects of the North Atlantic Oscillation, effects of 27-day and 11-year solar cycles.

Basis. Specific character of photochemical and dynamical processes in the polar regions determines peculiar regime of variability of polar ozone. Photochemical reactions affecting the ozone balance in polar stratosphere depend critically on temperature, and, therefore, on intensity of dynamical processes. The latter undergo significant intra-annual, seasonal and inter-annual variations. Some of variations have regular ore quasi-regular character and, therefore, can lead to predicted changes in ozone. Analysis of ozone variability due to these processes, in comparison with modeling results, is necessary for understanding and assessment of ozone changes.

Anticipated results. Characteristics of the annual variation of polar ozone in comparison with that for middle latitudes. Quasi-biennial variations of ozone, their relation to the quasi-biennial oscillation in the equatorial stratosphere and to the El Nino and the North Atlantic oscillation. Effects of 27-day and 11-year cycles on ozone. Ozone variability in the neighborhood of the tropopause. Effects of sudden winter stratospheric warmings on ozone in the Arctic.

Main kinds of investigations. Analysis of data of ozone sounding and of column ozone measurements at the world ozone measuring network. Analysis of satellite measurements of column ozone (Nimbus-7, Meteor-3, Earth Probe).
Theoretical study of solar activity effects with the help of 2-D and 3-D models.