Geophysical Research Abstracts,
Vol. 10, EGU2008-A-00450, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-00450
EGU General Assembly 2008

Study of surface ozone and nitrogen dioxide particularities and their relations with dynamic circulations of atmosphere of arid and semi-arid territories of Mongolia

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The experimental results of round-the-clock continuous synchronous measurements of concentrations of surface ozone (O_3), oxides of nitrogen (NO_x), meteorological, turbulent and radiating characteristics of atmosphere in arid and semi-arid territories of Mongolia are presented. Measurements were observed by means of the automated operative system of registration and statistical processing of measurements during joint Russian-Mongolian scientific expedition in desert Gobi in the summers 2005-2007. High concentrations of O_3, NO_2 were appeared during of all period of supervision in Desert Gobi. Diurnal variation of hourly averaged concentration of surface ozone have minimum equal 55 μg/m^{3}in morning and maximum equal 133 μg/m^{3}in daytime. High surface ozone and nitrogen dioxide concentrations in atmosphere of arid territories of Mongolia with hyperactivity of sunlight are connected with circulation of air masses in these latitudes which are characterized as “desert belt”. The air masses promote ozone transport from high layer of atmosphere and far transport of nitrogen compound gases. Moreover the absence of precipitations, the high heating of Earth’s surface and air convection during the long period of time lead to accumulation of atmospheric impurities in surface layer of atmosphere. The role of dynamic processes (synoptic conditions, meteorological and turbulence characteristics in high concentra-

tions formation of small gaseous impurities in the atmosphere of Desert Gobi, particularities of general circulation on the basis of archival radiosonde data are analyzed. Comparing of concentration of gaseous impurities in atmosphere of arid and semi-arid territories of Mongolia was carried out. The results of atmospheric aerosol radiative characteristics measurements (aerosol optical depth (AOD), water vapor content) with helping sun photometer SP-7 at stations Sainshand and Baruun-Urt are discussed. The work is supported by the SB RAS Complex integration projects No. 3.14, 3.23 and International program of Presidium of SB RAS No. 11.