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CO, CH4 and H_2O total contents: long-term Russian and Chinese spectroscopic datasets, seasonal, weekly and diurnal variations and temporal tendencies

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Analysis of the CO total column (TC) long-term measurements in Moscow and Beijing for period from 1992 to 2015 years is presented. Similar data of CO, CH4 and H_2O columns for Zvenigorod Scientific Station (ZSS) in 1970-2015 years are analyzed.
The rate of decrease of anthropogenic portion in CO TC over Moscow was equal to 1.4 % per year for 1992–2015 years in spite of multiple increase of the motor vehicles number. CO T decrease was observed in Beijing in 1992 - 2015 years with the rate 1.1% per year.
Typical levels of atmospheric CO and aerosols pollution in Beijing is 2–5 times stronger in comparison with Moscow ones. Reasonably typical events for Beijing with extreme values of CO TC and aerosols concentrations were observed in Moscow during wild fires of 2002 and 2010 years only. Trajectory cluster analysis using has allowed an investigation of CO and aerosols emissions sources location. Relatively stronger atmospheric pollution of Beijing partially due to the atmospheric transportation from distant industry regions of China located at 100-500 km from Beijing toward south, south-east and east directions.
Satellite observations (AIRS v6) have demonstrated the CO TC slow decrease in Moscow rural region and the significant decrease of CO TC over Beijing (2002-2014).
Rate of CH4 TC increase in Moscow region is 0.5% per year for 1972-2015.
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