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Interannual and seasonal variations of CO total column over Moscow megapolis

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We present the results of the CO total column (TC) spectroscopic measurements over Zvenigorod Scientific Station (ZSS) and Moscow for period from 1972 to 2012 years. The rural CO TC decreased by 0.1 – 0.5 % per year for different assessment techniques in 1972-2012.
Using the trajectory analysis we have calculated the average ("model") seasonal rural CO TC variations for all years of measurements (i.e. all events of Moscow emissions impact upon "rural" CO TC were excluded from these retrievals). Also we have estimated the effect of Moscow pollution sources upon the CO rural TC to be small: the percentage of days with ZSS CO TC exceeding average seasonal rural means more than 10% (i. e., typical STD of diurnal TC in the "rural" area) was found $\sim$5%.
The rate of decrease in the anthropogenic part of CO TC (total urban minus rural) was estimated at 0.9 - 1.1 % per year for 1974-2012 for different assessment techniques in spite of multiple increase of the motor vehicles number in Moscow. The rate of decrease of CO TC Moscow urban part for 2000-2012 is 2-4 % per year for different assessment techniques.
The average annual CO emissions in Moscow are estimated as 2.7 $\pm$ 0.9 Tg/year for 2005-2010.