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Distribution of CO, CH4 and AOD trends over industrial and background regions of Eurasia according to spectroscopic ground-based and satellite observations

Nikolai Elansky, Andrey Skorokhod, Vadim Rakitin, Yury Shtabkin, Anatoly Dzhola, Natalia Pankratova, and Alexander Safronov

A.M. Obukhov Institute of Atmospheric Physics RAS, Department of Atmospheric Chemistry, Moscow, Russian Federation (askorokhod@mail.ru)

Analysis of the CO and CH4 total column (TC) measurements and AOD data in urban and background regions of Eurasia for period from 1998 to 2016 years is presented. The trends estimates based on spectroscopic ground-based datasets of OIAP, SPSU, RPA "Typhoon" and NDACC (CO and CH4 TC) and AERONET stations were compared with similar ones obtained from AIRS v6 (CO and CH4 TC) and MODIS Terra/Aqua (AOD) orbital data.
Total decrease of CO TC in urban and industrial regions (Moscow, Bremen and Beijing) with the rate 0,8-2,0 %/y and in background regions (Zvenigorod, Peterhof, Obninsk, European NDACC sites) with the rate 0,3-0,9 %/y in 1998-2016 years has slowed or changed to stagnation (with annual averaging) and increase of CO in summer and autumn months in most of background regions of Northern Eurasia after 2007.
Negative trends of AOD were found for Europe, West Siberia and China for different seasons for time periods 2000-2016 and 2007-2016 from both AERONET and MODIS Terra/Aqua datasets analysis.
Rate of CH4 TC increased after 2007 in North-West Eurasian regions and has not changed in most of North-East regions except Northern Europe.
The negative AOD trends over Europe and West Siberia indirectly point out to absence of growth of wildfires emissions over this region in latest years. Therefore, the positive CO TC trends in summer and autumn months over background regions cannot be explained only by increase of wildfires impact or anthropogenic emissions. Possible reasons of such CO tendencies are likely to be related to the changes in all atmospheric photochemical system.
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