



Analysis of abnormal variability of CO total column amount over St. Petersburg, Russia: combination of experimental data and HYSPLIT model calculations

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Spectroscopic measurements of CO total column amount (TCA) over St. Petersburg during the period of intensive forest fires in North-West Russia in August-September 2002 have been analyzed. Variations of CO TCA have been found to be in the range of 200-300% with respect to background TCA values. The inverse trajectories of air parcels for the time period of measurements have been calculated using HYSPLIT model. The results demonstrated strong influence of the air mass origin on the CO TCA. The location and size of the forest fire hot spots near St. Petersburg have been derived from AVHRR NOAA satellite images. The particular attention has been paid to the intensive fire near the city of Pskov (about 300 km from the measurement site). Evolution of CO concentration inside the Pskov forest fire plume has been modeled using the dispersion part of HYSPLIT model. The combination of CO TCA measurement data and the results of model calculations of CO concentration in the plume has given the possibility to derive the estimate of CO emission. Mass of CO released by combustion for the considered Pskov forest fire is in the range of 0.17-0.26 kg/m². The derived values have been compared to the values, previously reported in literature for different types of forest fires.