



Analysis of satellite and ground-based measurements of CO₂ total content near Saint-Petersburg, Russia

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Studies of space-temporal variations of CO₂ content near St. Petersburg (Russia) have been conducted using ground-based measurements (local measurements of ground concentrations by the Los Gatos Research analyzer of greenhouse gases and spectroscopic measurements of the total contents by Bruker IFS 125 HR Fourier spectrometer) and also data of GOSAT, IASI and OCO-2 satellite measurements. Variations of CO₂ near-ground concentrations can reach ~ 100 ppm and more (25% and more) depending on a season, weather conditions; total content variations (by data of ground-based and satellite measurements) are 5-10%. All measurements of the CO₂ content demonstrate clear seasonal and long-term trends. Comparisons of CO₂ measurements by various methods and devices are carried out. The problem of possibility for using ground-based measurements in St. Petersburg for the validation of satellite measurements is discussed. For the analysis of the obtained various experimental data the HYSPLIT program and the WACCM modeling are used.