Aerosol transport over Siberia: analysis of the summer 2013 YAK-AEROSIB aircraft campaign

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Transport and transformation of aerosols related to forest fires and Eastern Asia anthropogenic emissions have been identified as very important questions to understand the Arctic climate. Two aircraft campaigns have been conducted over Siberia in summer 2012 and 2013 with in-situ measurements by aerosol spectrometers and also by a 532 nm backscatter lidar in 2013. The aerosol data can be also combined with CO measurements measured on-board the aircraft to identify the aerosol pollution sources. The analysis of the transport processes has been performed with the FLEXPART Lagrangian model run either in the forward or backward mode. While the 2012 campaign is characterized by anticyclonic conditions and strong forest fire emissions, the 2013 campaign corresponds to upward lifting of Northern China emissions. Comparisons with satellite data obtained with the CALIPSO mission for the two summer periods will be presented to identify the spatial extent and the temporal evolution of the pollution plumes and also to test the ability of the satellite data to derive the aerosol types. This work was funded by CNRS (France), the French Ministry of Foreign Affairs, CEA (France), Presidium of RAS (Program No. 4), Brunch of Geology, Geophysics and Mining Sciences of RAS (Program No. 5), Interdisciplinary integration projects of Siberian Branch of RAS (No. 35, No. 70, No. 131), Russian Foundation for Basic Research (grants No 14-05-00526, 14-05-00590).