

EGU21-5168

<https://doi.org/10.5194/egusphere-egu21-5168>

EGU General Assembly 2021

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## Spring-summer 2020 aerosol pollution in Moscow metropolitan area

**Nikolay Kasimov**, Olga Popovicheva, Dmitry Vlasov, Marina Chichaeva, and Anastasia Larionova  
Lomonosov Moscow State University, Moscow, Russian Federation (nskasimov@mail.ru)

Reduction of urban emissions following the response to COVID-19 pandemic has provided the unique possibility for assessment of the aerosol pollution in the metropolitan area with the highest population density in Russia. According to observation data obtained from the aerosol research station of Meteorological Observatory of Lomonosov Moscow State University, the strict control measures and social lockdowns initiated in spring 2020 in Moscow megacity have had a notable decreasing of PM<sub>2.5</sub>, black carbon (BC), and PM<sub>10</sub>-bound potentially toxic elements (PTEs) concentrations. The average concentration of PM<sub>2.5</sub> and BC has decreased by 42% and 75%, respectively, in comparison to the following period of economical restoration in summer 2020. A city traffic decrease led to a gentle dynamics of a BC diurnal trend due to a reduced energy load in the morning hours. Changes in the enterprises operating regime affected the redistribution of emissions intensities from working days to weekends. During the period of recovery of economic activity in the summer of 2020, the emission intensity has increased and the direction of BC sources has changed. Furthermore, these factors resulted in substantial increase in the pollution levels for the most of PTEs during the period of economical restoration. For instance, Ba, Sn, K, Cu, Bi, B, Mo, As, Sb, and Pb concentrations emitted from vehicles and industrial sources were increased by 42–167%. Levels of PTEs originated from construction and demolition processes (Sr, Mg, and Ca by 175%, 21%, and 19%, respectively), road dust and soil particles resuspension (Zr, P, Mn, and Fe, by 76%, 51%, 49% and 46%, respectively) also experienced the significant growth. Real-time measurements of short-term changes in the atmosphere aerosol pollution with a rapid extreme fall and subsequent restoration of economic activity allows a better understanding of the processes taking place in the system of economy-society-environment of large cities.