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A case study of high PM concentration despite the low anthropogenic pollution in March 2020 during the first COVID-19 lockdown in Sofia

E. Batchvarova ¹, N. Kolev ^{2, 3 a}, P. Savov ², M. Kolarova ⁴
¹ Climate, Atmosphere and Water Research Institute, Bulgarian Academy of Sciences, Sofia, Bulgaria
² Department of Physics, University of Mining and Geology "St. Ivan Rilski", Sofia, Bulgaria,
³ Institute of Electronics, Bulgarian Academy of Sciences, Bulgaria,
⁴ National Institute of Meteorology and Hydrology (NIMH) Sofia, Bulgaria

^a Corresponding author: nic_k@abv.bg











НП "ОПАЗВАНЕ НА ОКОЛНАТА СРЕДА И НАМАЛЯВАНЕ НА РИСК/ ОТ НЕБЛАГОПРИЯТНИ ЯВЛЕНИЯ И ПРИРОДНИ БЕДСТВИЯ"



FIGURE 1. Daily variations in PM2.5 and PM10 on 18 March 2020 and 28 March 2020 measured as particles per liter (N/L)



RESULTS AND DISCUSSION

The experiments were carried out on sunny days and days with dust intrusions from the Karakum desert region of the central Asia. The results obtained over three days (18.03.2020, 21.03.2020, and 28.03.2020) are analyzed here based on Laser particle counter measurements of number and mass PM10 and PM2.5 concentrations; model forecast for Boundary Layer Depth results for Sofia with WRF-GDAS model: air mass back-trajectories calculated by the HYSPLIT model ending over Sofia on 18 March 2020 and 28 March 2020.

FIGURE 2. Daily variations in PM2.5 and PM10 on 18 March 2020 and 28 March 2020 measured as particles per concentration mass (μ g/m3)







FIGURE 3. Model forecast for Boundary Layer Depth for Sofia WRF-GDAS model on 18 and 28 March 2020



FIGURE 4. Air mass back-trajectories calculated by the HYSPLIT model ending over Sofia on 18 and 28 March 2020

CONCLUSIONS

The air quality in Sofia was relatively good at the start of the first COVID-19 lockdown in March 2020.

This paper presents experimental data at a site near the boulevard "Tsarigradsko shoes" and suggests explanation of the event based on synoptic analysis and trajectory model results.

A significant increase of PM10 and PM2.5 concentrations was registered on March 28, 2020 related to transport of dust from the Caspean sea and Karakum desert regions.

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Thank you for your attention!