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[Lectures]

Aerosol vertical profiles and ABL heights derived from lidar measurements in Belgrade

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Abstract: Information on vertical profile of atmospheric aerosols is important in studies of aerosol contribution to air pollution, their role in cloud formation and radiative effects. Aerosol lidar measurements provide information on vertical profiles of aerosol backscatter and extinction coefficients. Besides, it can be used to derive the height of atmospheric boundary layer (ABL), which determines the volume available for dispersion of air pollution. Aerosol lidar measurements at 355 nm performed in Belgrade (Mijić et al., 2023) are used to derive vertical profile of aerosol backscatter coefficient and temporal changes of ABL height (Ilić et al. 2018). These measurements are used to determine the altitude of long-range transported aerosols (such as Saharan dust) and to detect their intrusion into the ABL. Selected cases of lidar-derived aerosol backscatter coefficient profiles corresponding to episodes of elevated air pollution, as well as episodes of long-range aerosol transport and their intrusion into the ABL, will be presented. Air pollution measurements in Belgrade, obtained from the Serbian Environmental Protection Agency (SEPA) automatic monitoring stations are used to select times of high and low particulate air pollution and to analyze the contribution of long-range transported aerosol to PM₁₀ concentrations at surface level.

Keywords: aerosol lidar, atmospheric boundary layer, aerosol backscatter coefficient, air pollution

References

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