A COMBINED WILDFIRE AND SAHARAN DUST EVENT OBSERVED AT A HIGH-ALTITUDE OBSERVATORY
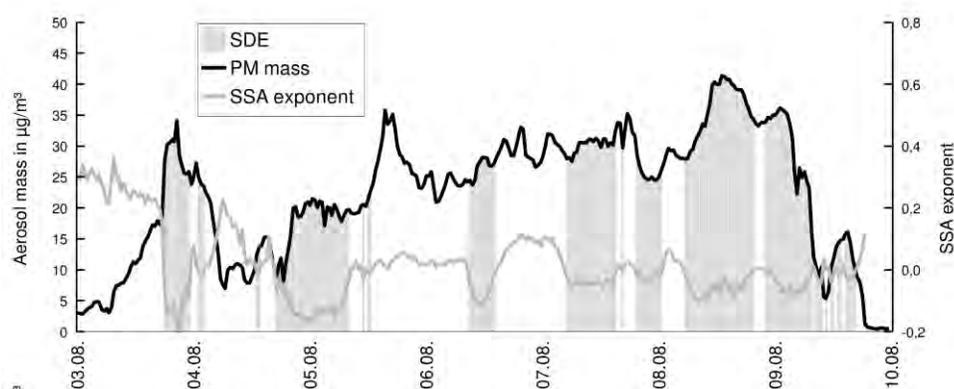
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A period of increased particulate matter concentrations was observed at the high-altitude Sonnblick Observatory in August 2013. Trajectory analysis and wildfire maps revealed the influence of long-range transport of Saharan dust and emissions of wildfires. Evaluation of aerosol measurements allowed to determine the combined and sometimes alternating influence of these emission sources. The occurrence of Saharan dust was confirmed by an increase of number concentrations of coarse particles and a negative exponent of the wavelength dependence of the single-scattering albedo, determined by nephelometer and Aethalometer measurements. During time periods less influenced by Saharan dust, number concentrations of accumulation mode particles increased and a marked correlation of aerosol mass concentrations and CO mixing ratios was observed. By analyzing the wavelength dependence of the absorption coefficients determined with a seven wavelength Aethalometer, the influence of the two aerosol sources was decoupled. Absorption Ångström exponents of 3 and 1.3 were assumed for Saharan dust and wildfires, respectively. Mass concentrations of particulate matter caused by Saharan dust and wildfire emissions were estimated, the contribution of Saharan dust to overall particulate matter mass ranged from 5% to 80%.

Acknowledgements