Characterization of Carbonaceous Aerosol at ChAMBRe

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Abstract:

In polluted atmospheres containing fine particulate matter (PM2.5), carbonaceous aerosols commonly constitute a significant and often predominant proportion. The term "carbonaceous" encompasses black carbon (BC), elemental carbon (EC), organic carbon/matter (OC/OM). Black carbon is the most important anthropogenic aerosol influencing the climate change. The influence of carbonaceous aerosol on air quality, visibility, cloud formation and characteristics, planetary radiation balance, and public health are all directly impacted by their tremendous diversity [1, 2]. For this purpose, we developed a multi-step experimental procedure to explore optical studies within controlled atmospheric conditions at ChAMBRe (Chamber for Aerosol Modeling and Bio-aerosol Research).

The developed experimental setup involves ChAMBRe for producing and sampling different aerosols, mainly black and brown carbon [3], a Dekati® eDiluter™ Pro for precise control and adjustment of aerosol concentrations to improve the accuracy of measurements [4], Total Carbon Analyzer (TCA08), Aethalometer (AE33), Nephelometer (Aurora 4000), Photoacoustic Extinction meter (PAXs), Organic Carbon/Elemental Carbon (OC/EC) thermo-optical Analyzers, Multi-Wavelength Absorbance Analyzer (MWAA) and BLAnCA (Broadband Light Analyzer of Complex Aerosol).

At ICESCS-24 we'll discuss the status of the project addressing the effectiveness of combining online and offline techniques for a comprehensive optical analysis of carbonaceous aerosols and their implications for environmental and public health policies.

Keywords:

Atmospheric simulation chamber, Carbonaceous aerosols, Optical properties.