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Chemical Composition and Emission Sources of the Fine Particulate Matters in a Southeast Asian Mega City (Dhaka, Bangladesh)

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Oral Presentation: Chemical Composition and Emission Sources of the Fine Particulate Matters in a Southeast Asian Mega City (Dhaka, Bangladesh)

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Abstract: Air pollution has significant impact on human health, climate change, agriculture, visibility reduction, and also on the atmospheric chemistry. There are many studies already reported about the direct relation of the human mortality and morbidity with the increase of the atmospheric particulate matters. Especially, fine particulate matters can easily enter into the human respiratory system and causes many diseases. Particulate matters have the properties to absorb the solar radiation and impact on the climate.
Dhaka, Bangladesh is a densely populated mega-city in the world. About 16 million inhabitants are living within an area of 360 square kilometers. Air quality situation has been degrading due to unplanned growth, increasing vehicles, severe traffic jams, brick kilns, industries, construction, and also transboundary air pollution. A rapidly growing number of vehicles has worsen the air quality in spite of major policy interventions, e.g., ban of two-stroke and three-wheeled vehicles, phase out of 20 years old vehicles, conversion to compressed natural gas (CNGs), etc. Introduction of CNGs to reduce air pollution was not the solution for fine particles at all, as evidence shows that CNGs and diesel engines are the major sources of fine particles. High concentration of the air pollutants in Dhaka city such as PM, carbonaceous species (black and organic carbon), CO, etc. has already been reported.
PM2.5 mass, chemical composition (e.g., BC, OC, SO42-, NO_3-, trace elements, etc.), aerosol Optical Depth (AOD) and emission sources of our recent measurements at the highly polluted south East Asian Mega city (Dhaka) Bangladesh will be presented in the conference. PM2.5 samples were collected on filters with Digital PM2.5 sampler (Switzerland) and Air photon, USA. BC was measured from filters (with thermal and optical method) and also real time with an Aethalometer AE42 (Magee Scitific., USA). Water soluble ions were determined from filters with ion chromatogram. AOD was continuously monitor with NASA AERONET sunphotometer. Carbon monoxide (CO) was measured continuously with Horiba CO monitor, Japan.