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Black carbon aerosol characteristics over the Indo-Gangetic Basin and the Indian Himalayan foothills: Implications to climate forcing

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BC aerosol characteristics were studied in India at Delhi (a polluted urban megacity in the Indo-Gangetic Basin) and at Manora Peak (a high-altitude and sparsely inhabited station in the Indian Himalayan foothills) during 2006 and 2007. Spring BC was found to be ~59% lower at Delhi and ~23% higher at Manora Peak than their winter BC. In the diurnal variability of BC, two enhanced peaks (morning and night time) were observed at Delhi whereas a single late afternoon peak was at Manora Peak. Using spectral information about BC, possible source identification studies were also carried out at both the stations. Results suggest that the major contribution at Manora Peak can be expected from biomass burning while at Delhi fossil fuel dominates. Being climatically sensitive region in the Indian Himalayan foothills, a model study was done at Manora Peak to quantify the contribution of BC to the total aerosol optical depth (AOD) and subsequently to the direct radiative forcing. Though the magnitude of BC mass concentration was found to be very low at Manora Peak (~1 µgm-3) as compared to Delhi (~15 µgm-3), it was estimated to contribute as high as ~17% to the total AOD and ~70% to the total atmospheric forcing at Manora Peak. Such a large warming effect of BC may raise several climatic issues through their significant impacts on strength of Himalayan glaciers, monsoon circulation and precipitation activities over India and its surrounding regions, which will be discussed as the major implications of the present study.

Biography

Dr. A. K. Srivastava received his PhD. degree at the age of 28 years from Pune University, Pune, India and Post-Doctoral studies from ARIES, Nainital, India. He is a Young Research Scientist at IITM, working in the field of atmospheric aerosols and their climatic impacts. He has published more than 15 research papers in reputed National and International Journals. He has also contributed a Book Chapter, in the upcoming Book "AEROSOL" of InTech Publication. He is serving as the editorial board member/reviewers of several repute and also active member of several research programs

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