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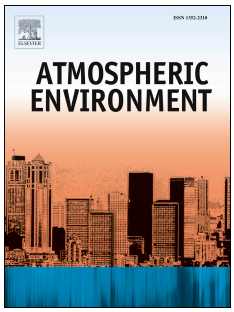

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Characteristics and Origins of Carbonaceous Aerosol in the Sichuan Basin, China

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Abstract

The Sichuan Basin is a low visibility area in southwest China, where the hilly and basin topography, plus humid and stagnant weather, lead to unique pollution patterns. To identify the characteristics and sources of carbonaceous aerosols, one-year record of 24-h $PM_{2.5}$ samples were analyzed for organic carbon (OC) and elemental carbon (EC) content following the thermal/optical transmission protocol at three cities (Chengdu (CD), Neijiang (NJ), and Chongqing (CQ)) in the region during May 2012 to April 2013. The annual average concentrations were 19.0±13.3 μg OC m^{-3} and 4.6±2.6 μg EC m^{-3} in CD, 18.3±8.4 μg OC m^{-3} and 4.1±1.8 μg EC m^{-3} in NJ, and 15.2±8.4 μg OC m^{-3} and 4.0±1.6 μg EC m^{-3} in CQ, respectively. Organic matter (1.6OC) plus EC contributed about 40% of $PM_{2.5}$ mass and displayed weak regional uniformity. Relatively high ratios of OC to EC were observed in the region with 4.3 for CD, 4.6 for NJ, and 3.8 for CQ, respectively. OC and EC pollution in the region exhibited interesting season-dependent characteristics with the lowest concentrations and OC/EC ratios in summer, but higher levels in other seasons. Higher OC/EC ratios in spring and autumn resulted from biomass burning, and in winter were from the