Effects of crop residue burning activities and meteorology on aerosol loadings over northwest India

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Crop residue burning activities are significant during April-May and October-November months over northwestern parts of India after harvesting rabi and kharif crops, respectively. These crop residue burning activities have raised serious concerns in different sectors, including environment, human health, and economy, making them important to be understood from different perspectives. To better understand the roles of meteorological factors (precipitable water content, boundary layer height, wind speed) on increased aerosol loadings during such crop residue burning events over northwest India, this study analyzes multiyear data of fire counts, aerosol loadings, and meteorological conditions obtained from satellite observations and reanalysis. Data analyses reveal important influence of precipitable water content on increased aerosol loading during April-May. On the other hand, intense crop residue burning activates during October-November, which is generally higher than those during April-May by ~3 times, are found to have more important role than meteorological factors on increased aerosol loadings at both surface and column atmosphere.

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