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Title:	Source Apportionment of Volatile Organic Compounds and Particulate Matter in Northwest India using Positive Matrix Factorization Model
Authors:	Pallavi
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Abstract:	<p>Air quality monitoring, devising management and mitigation strategies are critical to deal with the ever-growing problem of air pollution in India especially in the Indo-Gangetic Plains. This thesis work provides results of source apportionment studies performed for volatile organic compounds and particulate matter in an understudied environment in the northwest Indo-Gangetic Plain in summer month of 2012 using positive matrix factorization model (US EPA PMF 5.0 model). The study provides a comprehensive picture of the sources responsible for causing volatile organic compounds and particle pollution in and around Mohali, including the PMF modelled factors, real source sample fingerprints collected at various sites and their comparison with the source/ source contributions from global and regional emission inventories like EDGAR, REAS and GAINS. Source directionality is also determined using conditional probability function plots. Total volatile organic compound (VOC) burden at the site is explained by the following sources: "biofuel use and waste disposal" (23.2 %), "wheat-residue burning" (22.4 %), "cars" (16.2 %), "mixed daytime sources" (15.7 %) "industrial emissions and solvent use" (11.8 %), and "two-wheelers" (8.6 %). And top three sources contributing to PM10 and PM2.5 mass loadings at the receptor site are identified as "dust" (49% - 34%), "wheat-residue burning" (20% - 23%) and "biofuel use and waste disposal" (16% - 29%). Apart from the pollution sources that are active throughout the year, this work highlights the urgent need to manage the seasonal sources appropriately. Also, it provides important source contribution information about pollution sources in Mohali which can be used for impact assessment of air quality regulations or guidelines in place.</p>
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