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Title:	A modelling study using WRF-Chem over north India with improved transport and waste burning emissions
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Abstract:	Anthropogenic emissions can affect the local, regional, and global air quality and climate considerably. It has changed the earth's energy budget and increased global warming. The road transport sector is one of the major contributors to anthropogenic emissions of India. Road transport significantly degrades air quality by emitting volatile organic compounds and ozone precursors. It increases tropospheric ozone production and affects human health severely. The open waste burning sector is very poorly represented in the global emission inventories. It significantly pollutes regional air quality by emitting particulate matter and other air pollutants. In this work, we study road transport and open waste burning emissions using the WRF-Chem regional transport model. We set up the WRF-Chem model and validated it using the published results for the north Indian modelling domain. Then we applied it to study the air quality changes in the criteria air pollutants and volatile organic compounds over North India. We incorporated the improved road transport emission inventory and open waste burning emission inventory from India(OWBEII) into the WRF-Chem model. For the model simulation of 14 days(1May-14May, 2012), the use of improved road transport emission inventory relative to the EDGARv4.3.2 significantly increased modelled emissions of acetaldehyde(24%), toluene(23%), NO x (23%), acetone(13%), and decreased CO(-8%). The use of improved road transport and OWBEII waste burning inventory in the model further increased the modelled emissions of acetaldehyde(35%), toluene(30%), NO x (26%) and acetone(17%) relative to the EDGARv4.3.2.
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