



Biogenic voc emissions development and its impacts on regional o₃ in PRD, china

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The new Model of Emissions of Gases and Aerosols from Nature (MEGAN) has been coupled with WRF-Chem to investigate the influence of biogenic volatile organic carbon (BVOC) emissions on the regional distribution of O₃ and SOA concentration in the Pearl River Delta (PRD), China. MEGAN first estimate an emission factor which represents the net above-canopy emission rate expected at optimal conditions, and use a number of environmental correction factor based on photosynthetically activated radiation (PAR) and leaf temperature to adjust the emission rate due to deviations from optimal conditions. Total emissions are the sum of emissions estimated for each plant functional type (PFT) in a given grid cell. Our model simulations estimated showed: (1) Total annual BVOCs emissions were 339.01×10^6 kg, which is 40.68% of annual AVOCs emissions and 28.91 [U+FF05] of total VOCs emission in PRD in 2006. Isoprene, monoterpene, sesquiterpene and OVOCs contributed about 31.94%, 39.23%, 3.27% and 25.56% of the estimated total annual emissions respectively. - pinene and - pinene were the major components in monoterpene, which contributed 28.09% and 26.98 [U+FF05] to the total annual monoterpene emissions respectively; -caryophyllene and-farnesene were two important sesquiterpene, and they contributed to 22.31 [U+FF05] and 18.76 [U+FF05] of the annual sesquiterpene emissions.(2) BVOCs emissions have large variations in their spatial distributions, which were mainly resulted from the differences in the geographical distribution of vegetation. Their emission amounts were larger in the places where urbanization were relative lower and plants distributions were higher.(3) Emissions of terpenoids had significant annual and diurnal variations and the largest emission rate occurred at 13:00 local time while the amount of emission in summer is the largest.(4) There were significant terpenoids emission rate ($\geq 1.21.2$ kg km⁻²h⁻¹) in the remote areas in PRD region where the emissions of AVOCs were low, and terpenoids may control the air quality especially the ozone formation in those areas. WRF-Chem-MEGAN model will be used to investigate the impacts of BVOC on regional ozone concentration in PRD.