

肖娴,范绍佳,苏冉.2011年10月珠江三角洲一次区域性空气污染过程特征分析[J].环境科学学报,2014,34(2):290-296

2011年10月珠江三角洲一次区域性空气污染过程特征分析

Characteristics of a regional air pollution process over the Pearl River Delta during October 2011

关键词: [区域空气污染过程](#) [气象影响因素](#) [珠江三角洲](#)

基金项目: [国家自然科学基金项目 \(No.41275017\)](#); [高等学校博士学科点基金专项基金 \(No.20120171110028\)](#); [公益性行业\(气象\)科研专项 \(No.GYHY201306042\)](#)

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摘要: 2011年10月18—25日珠江三角洲地区出现了一次区域性空气污染过程, 重污染区域集中在西部, 后期向中部转移, PM_{10} 为首要污染物.针对本次空气污染过程的研究发现, 此次珠江三角洲地区空气污染过程主要受大尺度冷高压活动的影响, 一直为下沉气流所控制, 500 m以下近地层风速很小, 边界层高度较低, 存在贴地逆温层, 非常不利于污染物的输送和扩散. PM_{10} 浓度与风速、能见度呈显著的负相关关系, 与温度相关性不显著; 且与风速和温度的相关性存在滞后性.稳定天气形势、大范围下沉气流、近地层静小风和贴地逆温是导致这次区域性空气污染过程的气象原因, PM_{10} 浓度增加导致珠江三角洲能见度下降.

Abstract: A regional air pollution process occurred over the Pearl River Delta (PRD) Region during 18th to 25th October, 2011. The heavily polluted region tended to move from the west to the central region of PRD and the PM_{10} was found to be the primary pollutant. Result showed that this pollution process was mainly affected by the large-scale activities of cold high, when the PRD was dominated by the downdraft of cold high, with weak wind at the levels lower than 500 m of the surface layer and thin boundary layer and the inversion layer close to the ground. These factors limited transportation and diffusion of pollutants. The PM_{10} concentration had significantly negative correlations with wind speed and visibility and a weak positive correlation with relative humidity and temperature. There was a time lag for correlations between PM_{10} and wind speed as well as temperature. The atmospheric condition, large-scale downdraft, small wind speed and inversion layer close to the ground are the main meteorological reasons of this regional air pollution process, and the increasing PM_{10} concentration led to the decreased visibility of PRD.

Key words: [regional air pollution process](#) [meterological factors](#) [Pearl River Delta Region](#)

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