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论文

东亚地区春季黑碳气溶胶源排放及其浓度分布

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摘要: 本研究收集整理了东亚地区一个黑碳气溶胶的排放源,并利用一个三维化学输送模式系统模拟研究了东亚地区春季黑碳气溶胶的输送和演变过程.黑碳气溶胶浓度的模拟值与地面观测站和观测船获取的监测值相比,模拟值与监测值具有良好的一致性,这表明本研究收集整理的黑碳气溶胶的排放量及其分布是基本合理的,模式系统较好地反映了黑碳气溶胶浓度的时空分布和变化趋势,再现了许多观测到的重要特征.模拟结果表明,东亚地区春季间隙性的长距离输送对于西北太平洋海域的黑碳气溶胶浓度分布具有非常重要的影响.

关键词: 长距离输送 气溶胶 污染源 三维化学输送模式

Emissions and concentration distributions of black carbon aerosol in East Asia during the springtime

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Abstract: We use a three-dimensional chemical transport modeling system was applied to East Asia to investigate the transport and evolution processes of black

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carbon aerosol in the springtime based on a newly compiled regional emission inventory of black carbon aerosol. Simulated mixing ratios of black carbon aerosol were compared against observation data collected on ground stations and aboard a vessel. The comparison shows that simulated values were generally in good agreement with observed ones, and the model system captured the temporal and spatial variations in black carbon aerosol concentrations reasonably well, and reproduced many of the observed important features. Analysis of model results indicates that the intermittent long-range transport plays an important role in black carbon aerosol concentration distributions over the Northwestern Pacific during the springtime in East Asia.

Keywords: long-range transport aerosol emission three-dimensional chemical transport model

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