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现代应用光学

中国部分典型地区气溶胶光学特性观测

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摘要： 利用DTF型太阳光度计在我国几个典型城市地区较长期观测得到的资料,分析了不同地区气溶胶光学厚度日变化和季节变化特征,得到了各地区观测期间日均值、月均值和季节值的变化。结果显示,观测期间丽江地区气溶胶光学厚度最小,大气较洁净,大气中以细粒子为主;其次是张北;喀什和合肥地区气溶胶光学厚度都较大,但喀什、张北多以粗粒子为主,合肥多以细粒子为主。各地区都在春季气溶胶光学厚度较大,冬季最小。喀什的气溶胶光学厚度值多集中在0.15到0.7之间,张北多集中在0.08 到 0.4之间,合肥多集中在0.2到0.75之间,丽江多集中在0.01到0.1之间。各地区气溶胶光学厚度和Ångström波长指数频率分布基本呈高斯分布,气溶胶光学厚度峰值分布由高到低依次为合肥、喀什、张北、丽江,Ångström波长指数由高到低依次为丽江、合肥、张北、喀什。

关键词： 气溶胶光学厚度 太阳光度计 Ångström波长指数 典型区域

Atmospheric aerosol optical characteristics measured at several typical zones in China

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Abstract: The diurnal variation characteristics of Aerosol Optical Thickness(AOT) in different city regions and seasons were analyzed by using the long-term measurement data from a sun-photometer DTF in several typical regions of China. It indicates that the AOTs in Chinese different regions show complex and different diurnal variation characteristics and the diurnal variation trend is obviously different. The AOT variations of yearly-mean, monthly-mean, and seasonal-mean in each region were also presented. The results show that the AOT in Lijiang of Yunnan Province is the least, where the atmosphere is clean, and the small particles are dominant, and that in Zhangbei of Hebei Province is the second least one. The AOTs both in Kashi of Xinjiang province and Hefei of Anhui province are larger, and the bigger particles are dominant in Kashi while the smaller particles are dominant in Hefei. In every region, the AOT is larger in spring, and the smallest in autumn. Moreover, the value of AOT is between 0.15 and 0.7 in Kashi, 0.08 and 0.4 in Zhangbei, 0.2 and 0.75 in Hefei, 0.01 and 0.1 in Lijiang, respectively. The frequency distributions of AOT and Ångström index are basically Gauss distribution. The peak value distribution of AOT from high to low is Hefei, Kashi, Zhangbei, and Lijiang in turn and that of the Ångström index from high to low is Lijiang, Hefei, Zhangbei, and Kashi in turn.

Keywords: aerosol optical thickness sun-photometer Ångström index representative region

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