

引用本文(Citation):

蒋哲, 陈良富, 王中挺, 陶明辉. 珠江三角洲对流层气溶胶时空变化特征分析. 地球物理学报, 2013,56(6): 1835-1842,doi: 10.6038/cjg20130605

JIANG Zhe, CHEN Liang-Fu, WANG Zhong-Ting, TAO Ming-Hui. The analysis of spatiotemporal variation characteristics of tropospheric aerosol over the Pearl River Delta. Chinese Journal Geophysics, 2013,56(6): 1835-1842,doi: 10.6038/cjg20130605

珠江三角洲对流层气溶胶时空变化特征分析

蒋哲^{1,2}, 陈良富¹, 王中挺³, 陶明辉^{1*}

1. 遥感科学国家重点实验室, 中国科学院 遥感与数字地球研究所, 北京 100094;
2. 中层大气与全球环境探测实验室, 中国科学院大气物理研究所, 北京 100029;
3. 国家环境保护部卫星环境应用中心, 北京 100094

The analysis of spatiotemporal variation characteristics of tropospheric aerosol over the Pearl River Delta

JIANG Zhe^{1,2}, CHEN Liang-Fu¹, WANG Zhong-Ting³, TAO Ming-Hui^{1*}

1. State Key Laboratory of Remote Sensing Science, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, 100094 Beijing, China;
2. Laboratory for Middle Atmosphere and Global Environment Observation, Institute of Atmospheric Physics, Chinese Academy of Sciences, 100029 Beijing, China;
3. State Environment Protection Ministry, Environment Satellite Center, 100094 Beijing, China

摘要

参考文献

相关文章

Download: [PDF](#) (4067 KB) [HTML](#) (0 KB) Export: [BibTeX](#) or [EndNote](#) (RIS) [Supporting Info](#)

摘要

利用AERONET资料对珠三角地区气溶胶物理性质特征进行分析,建立珠三角地区的气溶胶模型,在此基础上,根据RT3 辐射传输模型构建矢量查找表,采用多角度偏振方法从PARASOL L1B数据反演得到细模态气溶胶光学厚度(AOD),最后采用2007—2009年MODIS总的AOD产品和本文的细模态AOD三年的反演结果分析了珠三角地区气溶胶的时间变化和空间分布特征,为深入研究珠三角地区污染物的局地排放和输送提供了条件.结果表明:(1)珠三角地区对流层气溶胶呈双峰型对数正态分布,其中细粒子平均半径主要集中在0.05~0.1,标准方差以0.5、0.6为主,粗粒子平均半径以0.9、1.0为主,标准方差为0.6、0.7,复折射指数实部以1.4、1.5 居多,虚部以0、0.01为主,细粒子所占比例大于70%,珠三角气溶胶呈现出粗颗粒物和细颗粒物并存特征;(2)PARASOL业务算法中的气溶胶模型在珠三角地区有较大的局限性,引入当地气溶胶模型使细模态AOD的反演精度较卫星产品有了很大提高,细模态AOD主要反映了珠三角地区二次污染的强度;(3)珠三角地区总AOD值春季较大,秋夏季次之,冬季较小,并呈现逐年较小的趋势;(4)珠三角地区细模态AOD也在逐年降低,2009年细模态AOD年均值比2007年低了0.02,在空间分布上,高值地区主要集中在广州、佛山、中山等城市.

关键词 对流层气溶胶, 时空变化, 气溶胶模型, 珠三角地区

Abstract:

The fine mode aerosols play a crucial role in human health. Directional polarized signals can be used to study the fine mode aerosol parameters. Aerosol model selecting in PARASOL operational algorithm has much limitation. Based on the analysis of AERONET, the physical properties of aerosol over Pearl River Delta Area are investigated; the sensitivity of polarization to aerosol physical properties such as mean radius, standard deviation and refractive index is evaluated through vector radiative transfer model. In this paper, we retrieved the spatial distribution of the fine mode aerosol from 2007 to 2009 in Pearl River Delta Area using PARASOL data by directional polarization method. Comparing the retrieval results, PARASOL aerosol products and AERONET data, we find that the precision of retrieving inversion can be improved by introducing local aerosol model. The annual average values of the fine mode aerosol are 0.1、0.09、0.079, which demonstrate the trend reduced year by year. Meanwhile, we analyze MODIS aerosol products during the three years, some statistical results are as follows: AOD is largest in spring, followed by autumn and summer and smallest in winter over the Pearl River Delta region.

Keywords Tropospheric aerosol, Spatiotemporal variation, Aerosol model, Pearl River Delta

Received 2012-09-06;

Fund:

Service

- [把本文推荐给朋友](#)
- [加入我的书架](#)
- [加入引用管理器](#)
- [Email Alert](#)
- [RSS](#)

作者相关文章

- [蒋哲](#)
- [陈良富](#)
- [王中挺](#)
- [陶明辉](#)

中国科学院知识创新工程重要方向项目(KZCX2-YW-Q10-2)资助.

About author: 蒋哲,女,1985年生,博士,中国科学院大气物理研究所,研究方向为大气遥感.E-mail:jiangzhejx@126.com

链接本文:

<http://manu16.magtech.com.cn/geophy/CN/10.6038/cjg20130605> 或 <http://manu16.magtech.com.cn/geophy/CN/Y2013/V56/I6/1835>

[查看全文](#) [下载PDF阅读器](#)

Copyright 2010 by 地球物理学报