

Retrieval of Aerosol Optical Depth and Land Surface Reflectance from FY3/MERSI data

Cheng Fan^{1,3}, Jie Guang¹, Yong Xue^{1,2}, Aojie Di^{1,3}, LuShe^{1,3}, Yahui Che^{1,3}

¹Key Laboratory of Digital Earth Science, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, Beijing 100101, China

²Faculty of Life Sciences and Computing, London Metropolitan University, 166-220 Holloway Road, London N7 8DB, UK

³University of Chinese Academy of Sciences, Beijing 100049, China

ABSTRACT

Medium Resolution Spectral Imager (MERSI), which enables images of the Earth with high spatial resolution and high temporal resolution, is an important sensor carried by on-orbit Chinese polar orbiting meteorological satellite Feng-Yun (FY-3). A new synergistic approach for retrieving BRDF (Bi-directional Reflectance Distribution Function) and aerosol optical depth (AOD) is developed. This new model was applied to FY3A/MERSI and FY3B/MERSI for retrieving AOD and surface reflectance over land in China. Results show that the correlation coefficients (R) between retrieved AOD from FY3 and AERONET sites is 0.68 at 550 nm. Therefore, FY-3/MERSI can serve a reliable and new data source for quantifying global environmental change.

风云 3-MERSI 数据反演气溶胶光学厚度和计算陆地地表反射率

摘要

中尺度光谱成像仪 (MERSI) 能够提供高空间和时间分辨率的对地观测数据。是中国的极轨卫星风云-3 上搭载的一个重要的遥感传感器。本文开发了一个基于陆地地表二项反射函数特性的气溶胶光学厚度的反演算法, 同时也可以计算地表反射率。新的算法应用到风云-3A 和风云-3B 的数据以反演中国地区 550nm 波段的气溶胶光学厚度和地表反射率。反演的结果与地表的 AERONET 观测站测量的对比显示相关系数可以达到 0.68。MERSI 数据与 AATSR 数据的集合可以弥补 AATSR 数据由于 ENVISAT 卫星的失效造成的数据间断。