

Retrieval of the Haze Aerosol Optical Depth from the Advanced Himawari Imager Data in China

Shenshen Li
(lishenshen@126.com)

China's industrialized regions have seen frequent occurrence of heavy haze caused by severe particle pollution. Geostationary satellite data, characterized by high temporal resolution, are important for observing the diurnal variation of air pollution over a large spatial scale. The Advanced Himawari Imager (AHI) aboard a geostationary weather satellite of Himawari 8 is a 16 channel multispectral imager to capture visible light and infrared images of the Asia-Pacific region. However, haze detection and retrieval is often excluded from the standard AHI aerosol and cloud products. A method to retrieve the Haze Aerosol Optical Depth (AOD) is developed, which includes (1) cloud/haze/clean-aerosol identification, (2) the generation of a surface reflectance relationship and database in hazy conditions, and (3) the development of haze aerosol models with four aerosol components by a global 3-D atmospheric chemical transport model (GEOS-Chem). This algorithm was used to retrieve 2 km AHI AOD over East China. The values of the retrieved Haze AOD are mostly between 0.5 ~ 2. A linear regression analysis for the retrieved results using AERONET ground data from June 2015 to June 2016 were performed with a correlation coefficient of 0.91. Retrieval uncertainties associated with the errors in haze detection, surface reflectance and haze models were analyzed using ground measurements.