Atmospheric Aerosol retrieval using the multi-channel geostationary satellite observation data

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With the launch of new generation geostaionary satellite, HIMAWARI-8, it has begun a new era of atmospheric and oceanic remote sensing. The Advanced Himawari Imager (AHI) aboard HIMAWARI-8 satellite offers capabilities for aerosol remote sensing similar to those currently provided by the Moderate resolution Imaging-Spectroradiometer (MODIS). This study presents an algorithm to retrieve timly aerosol information using multi-channel and multi-temporal observation data from the Advanced Himawari Imager (AHI) aboard HIMAWARI-8 satellite. Aerosol properties were well estimated in a coupled detection and inversion techniques from the comparison of satellite-observed radiances with those calculated from radiative transfer model (RTM) with predifined aerosol properties including size distribution and chemical compositions. The algorithm estimate the aerosol optical thickness (AOT) at visible wavelength and mineral dust/volcanic ash at infrared wavelength as the byproducts. In general, the AHI retrieved AOT values captured the spatial and temporal variations over East Asia. In addition, the retrieved AOT were compared with Aerosol Robotic Network (AERONET) measurements, which shows good consistency.