



Discrimination of Biomass Burning and Anthropogenic Pollutants for the Impact on the Downward Shortwave Flux with Satellite Retrieval

Tang-Huang Lin (1), Wei-Hung Lien (2), Gin-Rong Liu (1), Chian-Yi Liu (1), and Kuo-En Chang (2)

(1) National Central University, Center for Space and Remote Sensing Research, Jhongli City, 32001 Taiwan
(thlin@csrsr.ncu.edu.tw), (2) Graduate Institute of Space Science, National Central University, Jhongli City, 32001 Taiwan

The long term observations of aerosol properties from AERONET sites indicate that aerosol type of mineral dusts, smoke plumes and anthropogenic pollutants can be potentially identified with the characteristics of optical properties, such as Ångström exponent (AE) and Single Scattering Albedo (SSA). However, the retrieval of SSA is not frequently available for the application over a wide area, for instance, the SSA products from satellite retrievals. In order to overcome such kind of limitation, this study aims at the spectral variance in optical depth for the discrimination of the aerosol types, especially focuses on the plumes of biomass burning and anthropogenic pollutants. The validations in discrimination smoke aerosols from anthropogenic pollutants are eventually examined with MODIS data, and the results show the well agreement with the ground-based observations from AERONET sites, implying that the proposed approach is highly practical for the discrimination of aerosols types by means of remote sensing. Since different aerosol types exhibit different absorption and scattering properties which can affect the solar incoming and outgoing radiance on the surface and at the top of atmosphere, the effects of smoke plumes and anthropogenic pollutants on downward shortwave flux near the surface will be investigated with CERES (Clouds and the Earth's Radiant Energy System) products as well.

Keywords: Biomass Burning, Anthropogenic Pollutants, Aerosol Optical Property, MODIS, AERONET, CERES