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Operational retrieval of Asian sand and dust storm from FY-2C geostationary meteorological satellite and its application to real time forecast in Asia

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Abstract. This paper describes an operational retrieval algorithm for the sand/dust storm (SDS) from FY-2C/S-VISSR (Stretched-Visible and Infrared Spin-Scan Radiometer) developed at the National Satellite Meteorological Center (NSMC) of China. This algorithm, called Dust Retrieval Algorithm based on Geostationary Imager (DRAGI), is based on the optical and radiative physical properties of SDS in mid-infrared and thermal infrared spectral regions as well as the observation of all bands in the geostationary imager, which include the Brightness Temperature Difference (BTD) in split window channels, Infrared Difference Dust Index (IDDI) and the ratio of middle infrared reflectance to visible reflectance. It also combines the visible and water vapor bands observation of the geostationary imager to identify the dust clouds from the surface targets and meteorological clouds. The output product is validated by and related to other dust aerosol observations such as the synoptic weather reports, surface visibility, aerosol optical depth (AOD) and ground-based PM_{10} observations. Using the SDS-IDD product and a data assimilation scheme, the dust forecast model CUACE/Dust achieved a substantial improvement to the SDS predictions in spring 2006.

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