

MERSI onboard Chinese Fengyun-3: quantitative ability for aerosol retrieval

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The MEdium Resolution Spectral Imager (MERSI) onboard Chinese Fengyun-3 (FY-3) satellite is designed similar to MODIS and VIIRS, which would be an important supplement for multi-sensor measuring aerosol temporal and spatial distribution. But, there is no reliable aerosol product from MERSI by now. The plan of FY-3 missions is a sequence of eight satellites. Four have been launched, FY-3A in 2008, FY-3B in 2010, FY-3C in 2013, and recent FY-3D in the end of 2017. As the sensor MERSI becomes more mature, the demand of quantitative product is very urgent. Here, we apply MODIS land dark target (DT) algorithm to MERSI to test the quantitative ability of aerosol retrieval. Considering the sensor difference between MODIS and MERSI, we modified the process of gas absorption, cloud/snow/inland-water mask, pixel aggregation, and the most important part of band ratio for surface reflectance estimation. The global MERSI/FY-3C data of a whole year has been tested for retrieval. And the AEROENT data are used for ground validation. The scattering plot shows that MERSI AOD (aerosol optical depth) agrees well with AERONET observation that 70.7% collocations fall within expected error $EE = \pm (0.05 + 0.15\tau)$, which is even better than MODIS/TERRA AOD that 66.6% fall within EE. The global maps of monthly mean AOD are also consistent as well as MODIS. Finally, we made test to MERSI-II/FY-3D, the preliminary results also have a good validation and agree well with MODIS. The results of this talk indicates that the MERSI sensor has the quantitative ability for aerosol retrieval, and would be an important member of multi-sensor for aerosol measurements.

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