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The FY-3D Global Active Fire product: Principle, Methodology and Validation

Jie Chen, Qi Yao, Ziyue Chen, Manchun Li, Cheng Liu, Wei Zheng, etc.

National Satellite Meteorological Center,
Beijing Normal University, Nanjing University,
China Agricultural University

Wildfires have a strong negative effect on environment, ecology and public health. However, the potential degradation of mainstream global fire products leads to large uncertainty on the effective monitoring of wild fires and its influence. To fill this gap, we produced FY-3D global fire products with a similar spatial and temporal resolution, aiming to serve as the alternative and continuity for MODIS global fire products. Firstly, the sensor parameters and major algorithms for noise detection and fire identification in FY-3D products were introduced. For visual-check-based accuracy assessment, five typical regions, Africa, South America, Indochinese Peninsula, Siberia and Australia, across the globe were selected and the overall accuracy exceeded 94%. Meanwhile, the consistence between FY-3D and MODIS fire products was examined. The result suggested that the overall consistence was 84.4%, with a fluctuation across seasons, surface types and regions. The high accuracy and consistence with MODIS products proved that FY-3D fire product was an ideal tool for global fire monitoring. Based on field-collected reference data, we further evaluated the suitability of FY-3D fire products in China. The overall accuracy and accuracy (without considering omission errors) was 79.43% and 88.50% respectively, higher than that of MODIS fire products. Since detailed local geographical conditions were specifically considered, FY-3D products should be preferably employed for fires monitoring in China. FY-3D fire dataset can be downloaded at http://satellite.nsmc.org.cn/portalsite/default.aspx (NSMC, 2021), or at http://figshare.com with the identifier doi: “10.6084/m9.figshare.20102210”.