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## The application of FengYun-3 Microwave Radiation Imager soil moisture product in drought monitoring

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FY-3(Feng Yun 3) satellites series are the China's second-generation polar-orbiting meteorological satellites. FY-3B is the second satellite of FY3 series which was launched on November 5, 2010. One of the eleven instruments on board the FY-3B satellite is the Microwave Radiation Imager (MWRI) which is a highly sensitive microwave radiometer. It is China's first space-borne microwave radiometer. It has 5 different frequencies from 10.65GHz to 89GHz with dual polarization. The MWRI instrument provides measurements of terrestrial, oceanic, and atmospheric parameters, including precipitation rate, sea ice concentration, snow water equivalent, soil moisture, atmospheric cloud water, and water vapor. Soil moisture, as a key parameter in the drought monitoring, becomes especially concerned. The FY-3B/MWRI soil moisture product provides global observations of land surface soil moisture. The current soil moisture retrieval algorithm of FY-3B/MWRI uses the brightness temperature with both v and h polarizations of 10.65GHz to eliminate the effects of surface roughness and vegetation simultaneously. For the bare surface soil estimation part, the algorithm is based on a parameterized surface emission model (the Qp model) which uses a physically based soil moisture inversion technique for application with passive microwave measurements. For the vegetation correction part, the algorithm uses the empirical relationship between the NDVI and the vegetation water content to estimate the vegetation optical depth. The spatial resolution of FY-3B/MWRI soil moisture product is 0.25°×0.25°. In recent years, drought occurs frequently worldwide. As the only microwave sensor which operationally provides global soil moisture products currently in china, the FY-3B/MWRI soil moisture product plays an important part in drought monitoring during the meteorological service. In the summer of 2014, Henan Province which is located in the middle area of China suffered severe drought. The soil moisture of this area remained a very low level all along until significant precipitation finally came in last September. In the year of 2018, there was a severe drought occurred in Afghan, we used a long-time data series to analyze this drought event. The result showed that the FY-3B/MWRI soil moisture can objectively reflect the spatial distribution and development process of drought. This paper will give an introduction of the applications of FY-3B/MWRI soil moisture product during these drought event.