FY3 is new generation polar orbit meteorological satellite of China plan to launch in 2006. There is total of 11 different remote sensing sensor onboard it, design to get the geophysical parameters of atmosphere, land, and ocean surfaces at the same time all day and night and in all weather conditions. The MWRI is a 10-channel five-frequency linearly polarized, passive microwave radiometer imager system onboard the FY3, which measures atmospheric, ocean, and terrain microwave brightness temperatures at 10.65, 18.7, 22.3, 36.5, and 89 GHz. In this paper, in order to derive surface temperature and soil moisture from the MWRI data, a new developed microwave RT model, AIEM was used to simulate the microwave emission characteristic of bare soil, and an new surface soil moisture inversion algorithm was established, which is only need the 10.65GHz V and H channel data. Applying the algorithm to AMSR-E orbit data, which is very similar with the FY3/MWIR, the daily globe soil moisture distribution was derived. The surface temperature was also derived by using a empirical model. To compare the inversion results with insitu data, the meteorological data in china area was collected, and points were interpolated to area with the resolution of MWIR by using a new interpolate model of complex terrain.
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