Geophysical Research Abstracts
Vol. 21, EGU2019-6282, 2019
EGU General Assembly 2019

The radiometric characteristics and data monitoring for MWHS II onboard FY-3C

Yang Guo (1) and Jieying He (2)

(1) Key Laboratory of Radiometric Calibration and Validation for Environmental Satellites, National Satellite Meteorological Center, China Meteorological Administration, Beijing (guoyang@cma.gov.cn), (2) Key Laboratory of Microwave Remote Sensing, National space science center, Chinese Academy of Sciences [U+FF08] hejieying@mirslab.cn [U+FF09]

The microwave humidity sounder (MWHS) is a five channel microwave radiometer in the range of 150-191GHz onboard FY-3A and FY-3B. FY-3A and FY-3B were successfully launched in 2008 and 2010 respectively. The next generation of MWHS is a microwave humidity and temperature sounder which is known as MWHS II. This sensor is being developed to fly on the third satellite of new generation polar orbit meteorological satellite of China (FY-3C) due to be launched in September 2013. The MWHS II has fifteen channels in the rang 89-191GHz. Eight temperature sounding channels with center frequent on 118.75GHz oxygen gas line and five humidity sounding channels with center frequent on 183.31GHz water vapor line. Two window channels centered at 89 and 150GHz. 118GHz channel is first used to detect atmosphere on current operational satellite.

In order to analyze capability of MWHS II sounding channels in atmospheric parameters detection, the basic atmospheric parameters data are coupled with the microwave radiative transfer model to simulate the radiometric characteristics of 118GHz and 183GHz. The different kinds of hydrometeors can significantly affect the brightness temperature of 118GHz and 183GHz channels. When mixing ratios of rain drops increase, the brightness temperature of channel 9 decreases about 4.5K. Furthermore the brightness temperature of channel 9 decreases about 10K, when mixing radio of snow at middle layers increase. This result indicates this channel can be used to detect the snow particle.

MWHS II data from FY-3C have been already assimilated at operational numerical weather prediction (NWP) model in the ECWMF (European Centre for Medium-Range Weather Forecasts), UK Met Office and CMA (China Meteorological Administration). In order to monitoring the quality and stability of MWHS II data, the FY-3 monitoring system has been established. This system can monitor the first guess departure, component temperature, scan angles and other parameters of MWHS II. The comprehensive quality flag include 14 parameters is used to describing the MWHS II data quality. Based on the quality flag, the data application will be enhanced.