



The microwave instruments onboard FY-3 and their application in tropical cyclone precipitation retrieval

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With the increasing awareness of the importance of meteorological satellite, China initiated FENGYUN satellite program in 1971 and the first polar orbiting meteorological satellite FY-1A was launched in 1988. Up to now, totally 6 FENGYUN polar orbiting meteorological satellites were launched, of which FY-A/B/C/D belongs to the first generation with only one instrument on board and their applications mainly focused on image analyses. The second generation of Chinese polar orbit meteorological satellite, FY-3A /B /C were launched in 2008, 2010 and 2012 respectively. there were 11 instruments onboard FYA/B/C with both sounding and imaging capability, covering the spectrum from ultraviolet, visible, infrared to microwave.

There are three microwave instruments onboard FY-3 series, including Microwave Humidity Sounder (MWHS), Microwave Temperature Sounder (MWTS) and Microwave Radiation Imager (MWRI). This paper first introduces these three instruments, their channel characteristics and their global O-B results. Their observations are also compared with NOAA equivalent channels.

The second part of this paper introduces the tropical cyclone precipitation retrieval technique developed by NSMC, which include:

- 1) Precipitation concept model introduction
- 2) Precipitation sensitivity analysis
- 3) Satellite microwave imagery analysis
- 4) "Overlap lookup table" technique introduction
- 5) Results analysis

The FY-3 precipitation retrieval products are operationally used in weather analysis and forecast. Due to China's vast territory and complex climate, the satellite data are irreplaceable and have been intensively applied to monitoring the severe weather such as typhoon, heavy precipitation etc. over China.