

Exploration on the observation ability and application potential of China's first spaceborne precipitation measurement radar

Jian SHANG^{1,2,3}, Qiong WU^{1,2,3}, Mei YUAN^{1,2,3}, Honggang YIN^{1,2,3}, Peng ZHANG⁴

1. National Satellite Meteorological Center (National Center for Space Weather), Beijing, China

2. Innovation Center for FengYun Meteorological Satellite (FYSIC), Beijing, China

3. Key Laboratory of Radiometric Calibration and Validation for Environmental Satellites, Beijing, China

4. CMA Meteorological Observation Center, Beijing, China

China successfully launched its first precipitation measurement satellite Fengyun-3G (FY-3G) in 2023, operating in a non-sun synchronous orbit with a height of 407 km and an inclination of 50 degrees. The core instrument precipitation measurement radar (PMR) of the FY-3G can measure the spatial distribution, vertical structure and microphysical parameters of precipitation in low and middle latitudes around the world, helping to strengthen the research on global precipitation and enhance the understanding of precipitation structure, mechanism and global water cycle. This presentation introduces the in-orbit performance of the PMR and its application potential beyond the operational applications. The maneuver observation experiment for typhoon was carried out for the first time in 2024 and this presentation introduces the design of maneuver observation mission as well as the observation result. On the other hand, the consistency calibration and fusion algorithm of satellite-ground radar reflectivity factor is developed and this presentation introduces the preliminary results and the application potential in typhoon monitoring.

The data products of FY-3G remote sensing instrument have been carefully verified and are open to users all over the world (<http://satellite.nsmc.org.cn/DataPortal/en/home/index.html>).