

Abstract: Monitoring the Stability of the Advanced Microwave Radiometer onboard Jason series Satellites

Bin Zhang, Xi Shao, and Changyong Cao

The global sea level is steadily rising with a rate of about 3 mm/year from both tidal gauge and satellite observations. The Jason series satellites, combined with European satellites have monitored the world ocean surface height anomaly for more than two decades. These satellites measure the distance between the sea surface and satellite using active microwave radar. The mean speed of the radar signal and the path time is used to calculate the distance. However, the speed of the radar signal is largely affected by the water vapor contents in the wet troposphere, which accounts for the correction of 20-40 cm. The altimeter is usually accompanied by an Advanced Microwave Radiometer to measure the water vapor content in the wet troposphere to make the corrections. Due to its large contribution in altimetry measurement correction, its stability and the long term trend is vital in producing a meaningful time series of the global sea level changes.

Jason-3 was launched on Jan, 2016, following the same orbit of Jason-2, but leading with 82 seconds during the first 8 months. The Jason-2 moved to another orbit after then. The 8 month periods provide a good opportunity for inter-comparison between Jason-3 and Jason-2. The Jason-3 AMR stability and trends regarding of the water vapor band during the first 9 month will be compared with Jason-2 using different methods. The impact to the sea level measurement will be discussed.