



Data Assimilation and verification based on GEO microwave observations

Jieying He (1) and Yang Guo (2)

(1) China (hejieying@mirslab.cn), (2) Chian(guoyang@cma.gov.cn)

THE frequency band from 50 to 56 GHz has been used to retrieve atmospheric temperature profiles through radiometric measurements at and near absorption maxima. Sensors working around 50–56 GHz are now only available on low earth orbit (LEO), and are still lacked in the geostationary earth orbit (GEO) application. Compared with LEO sounding, sensors working in GEO orbit can continuously monitor the full earth disk and perform.

The Geostationary Interferometric Microwave Sounder (GIMS) is a synthetic aperture microwave sounder working in time-sharing sampling mode with a rotating circular antenna array.

Real-time forecasting for short-term meteorological phenomena such as tropical cyclones, which is one of the most important natural disasters that cause severe damage in coastal areas around the world. Furthermore, since information available in microwave band is different from that available in visible/

infrared frequency, microwave sensor in GEO orbit can complement the existing sensors in GEO orbit that work in visible/infrared frequency to determine vertical temperature distribution and thus help investigate inner structure of tropical cyclone.

Till 2018, a lot of improvement of WRFDA has been realized, such as radar data and LEO microwave data. It has the ability of providing initial conditions for the WRF model and assessing observing system. However, one major constraint of WRFDA is the ability of assimilating GEO microwave observations into the assimilation model and verify how the GIMS sensor effect the output data of model, especially for synthetic aperture microwave sounder.

In this paper, we focus on surface pressure and precipitation in hurricane and typhoon areas based on WRF and WRFDA model with GEO microwave observations assmilated and some significant results have been achieved.

Keyword: geostationary earth orbit (GEO); full earth disk; The Geostationary Interferometric Microwave Sounder; Real-time forecasting