

Prospect of future geostationary satellite observations for numerical weather prediction

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The revolutionary meteorological geostationary satellite Himawari-8 was launched in October 2014. The operation is planned to start in July 2015. Advanced Himawari Imager (AHI) on Himawari-8 significantly enhances spectral, spatial, and temporal measurement capability. It enables us to make detailed observation with three visible bands with 500 m or 1 km resolution and 13 infra-red bands with 2 km resolution. Furthermore imagery scanning is performed every 2.5 minutes around Japan and every 10 minutes for the full disk. Furthermore rapidly scanning imagery is produced every 2.5 minutes around Japan and every 10 minutes for the full disk. These improved functions are useful for monitoring meteorological disaster and for production of initial fields for numerical weather prediction. Among them, the highly frequent imagery had never been achieved by any other space-borne imagers and is expected to give us new knowledge that is socially and scientifically beneficial. For example, the research is under way on assimilating the rapid scan data of Himwari-8 together with ground-based radar data to accurately predict rapidly developing convective clouds and precipitation.

Even the enhanced function of Hiwamari-8, however, does not meet all of the keen requirements of weather forecasters and data assimilation community. AHI hardly makes measurements under clouds and about vertical temperature and humidity profiles. Furthermore there is an increasing need for frequent measurements of atmospheric composition and lightning. Good candidates to meet those requirements are microwave radiometers, hyperspectral infra-red sounders, ultra-violet sensors and optical lightning mappers onboard future geostationary satellites.

We will discuss the benefit of these new instruments on geostationary satellites, especially from viewpoint of the numerical weather prediction and data assimilation.

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