Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

ATT34-P05 Room:Convention Hall Time:May 20 15:20-15:30

Satellite Remote Sensing of the Atmosphere: Past and Future

HAYASAKA, Tadahiro[1*]

[1]Graduate School of Science, Tohoku University

The observation of the Earth from space started in 1959 by the satellite Explorer 6 launched in the United States of America, which took the picture and measured the radiation budget although the orbit was highly elliptical. Since then, NASA and NOAA of USA have continued to develop and launch the Earth observing satellite. Various types of sensor have been developed to observe the atmosphere up to now. Radiometers on board satellite cover the wavelength from UV to microwave spectral region to observe the air temperature, water vapor profile, clouds, aerosols, and so on. In addition to the radiometers, active sensors such as lidar and radar were launched and used to observe vertical profiles of cloud and aerosol, and precipitation from space. Japanese geostationary meteorological satellite so called Himawari was launched in 1977 for the first time and it continued the present MTSAT series.

The algorithm to retrieve atmospheric properties has also been developed and advanced as well as hardware development. However, it looks almost completed at present except for a few special sensors such as hyper-spectral radiometer active sensors, and a new algorithm development is difficult for visible and infrared imagers since the standard products obtained from them are already highly sophisticated. Atmospheric parameters related to climate change, for example, water vapor, cloud microphysics and aerosols properties are available like objective analysis meteorological data. Data assimilation analysis is also being carried out recently by using satellite observation data and GCMs. A limited number of scientists are concerned with basic hardware and algorithm developments in Japan.

With the above background, the future of satellite observation of the atmosphere has been discussed in a research community in Japan. The new frontier of satellite remote sensing of atmosphere will be limited to a few fields, that is, hardware and algorithm developments for active sensors, more sophisticated combinations of active and passive sensors, utilization of geostationary satellite to observe cloud, water vapor, and chemical properties of atmosphere with a high temporal resolution. Based on the above preliminary discussion, I will discuss more about the perspective of satellite remote sensing of atmosphere in the future.

Keywords: Atmosphere, Satellite remote sensing