

Cloud properties analysis based on EarthCARE/MSI observation

*Seiko Takagi¹, Takashi Nagao², Haruma Ishida³, Husi Letu⁴, Makiko Hashimoto², Takashi Nakajima⁵

1.Tokai University, Research and Information Center, 2.Japan Aerospace Exploration Agency, 3.Meteorological Research Institute, 4.Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences (CAS), 5.Tokai University, School of Information Science & Technology, Dept. of Human & Information Science

Clouds and aerosols are the major uncertainty in the understanding of the Earth's climate system. An improvement of understanding and better modeling of the relationship of clouds, aerosols and radiation are therefore prominent part in climate research and weather prediction. It is important to obtain the global data of clouds and aerosols occurrence, structure and physical properties that are derived from measurements of solar and thermal radiation.

EarthCARE (Earth Clouds, Aerosols and Radiation Explorer) is one of the future earth observation mission of ESA and JAXA. The satellite will carry four instruments for observation of clouds and aerosols; Atmospheric Lidar (ATLID), Cloud Profiling Rader (CPR), Multi-Spectral Imager (MSI), and Broad-Band Radiometer (BBR). This mission aims at understanding of the role that clouds and aerosols play in reflecting incident solar radiation back into space and trapping infrared radiation emitted from Earth's surface. These observations are needed to improve the precision of climate variability prediction.

MSI provides across-track information on cloud with channels in the visible, near infrared, shortwave and thermal infrared. Water cloud optical properties are derived in using EarthCARE/MSI standard product based on CLAUDIA [Ishida and Nakajima, 2009] and CAPCOM [Nakajima and Nakajima, 1995; Kawamoto et al., 2001]. Research product based on MWP method [M. Hashimoto, 2015. PhD Thesis] is advanced to obtain the ice cloud optical properties. In this presentation, development of the cloud analysis algorithms will be introduced.

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