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Current status and development of Cloud analysis algorithms based on EarthCARE/MSI observation

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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. 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.

The mission will achieve the objectives by measuring the vertical structure and horizontal distribution of clouds and aerosols globally. The satellite will carry four instruments for observations of clouds and aerosols; Atmospheric Lidar (ATLID), Cloud Profiling Rader (CPR), Multi-Spectral Imager (MSI) and Broad-Band Radiometer (BBR). MSI provides across-track information on clouds and aerosols with channels in the visible, near infrared, shortwave and thermal infrared. Two products based on CLAUDIA [Ishida and Nakajima, 2009] and CAPCOM [Nakajima and Nakajima, 1995; Kawamoto et al., 2001] are advanced in this study. In this presentation, current status and development of algorithms will be introduced.

Keywords: EarthCARE, MSI, cloud, aerosol