



The Earth Clouds and Radiation Explorer (EarthCARE) Mission: Cloud and Aerosol Lidar and Imager algorithms.

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The value of multi-sensor remote sensing applied to clouds and aerosol has become clear in recent years. For example, combinations of instruments including passive radiometers, lidars and cloud radars have proved invaluable for their ability to retrieve profiles of cloud macrophysical and microphysical properties. This is amply illustrated by various results from the US-DoE ARM (and similar) surface sites as well as results from data collected by sensors aboard the A-train satellites CloudSat, CALIPSO, and Terra. The Earth Clouds Aerosol and Radiation Explorer (EarthCARE) mission is a combined ESA/JAXA mission to be launched in 2018 which has been designed with sensor-synergy playing a key role. The mission consists of a cloud-profiling radar (CPR), a high-spectral resolution cloud/aerosol lidar (ATLID), a cloud/aerosol multi-spectral imager (MSI), and a three-view broad-band radiometer (BBR). The mission will deliver cloud, aerosol and radiation products focusing on horizontal scales ranging from 1 km to 10 km. EarthCARE data will be used in multiple ways ranging from model evaluation studies, to GCM-orientated cloud microphysical property parameterization development, to data assimilation activities.

Recently a number of activities, funded by ESA, have kicked-off which will ultimately deliver operational algorithms for EarthCARE. One of these activities is the “Atmospheric Products from Imager and Lidar” (APRIL) project which focuses on the development of lidar, imager and combined lidar-imager cloud and aerosol algorithms. In this presentation an overview of the APRIL algorithms within the wider context of the planned EarthCARE processing chain will be given.