

Two corrections in this issue:

Abstract replaced in line with reviewers recommendation:

The Earth Cloud Aerosol and Radiation Explorer (EarthCARE) is a satellite mission implemented by the European Space Agency (ESA), in cooperation with the Japan Aerospace Exploration Agency (JAXA), to measure global profiles of aerosols, clouds and precipitation properties together with radiative fluxes and derived heating rates. The simultaneous measurements of the vertical structure and horizontal distribution of cloud and aerosol fields, together with outgoing radiation, will be used in particular to evaluate their representation in weather forecasting and climate models, and to improve our understanding of cloud and aerosol radiative impact and feedback mechanisms. To achieve the objective, the goal is that a retrieved scene with footprint size of 10 km × 10 km is measured with sufficiently high resolution that the atmospheric vertical profile of short-wave (solar) and long-wave (thermal) flux can be reconstructed with an accuracy of 10 Wm<sup>-2</sup> at the top of atmosphere.

To optimise the performance of the two active instruments, the platform will fly at a relatively low altitude of 393 km, with an equatorial revisit time of 25 days. The scientific payload consists of four instruments: an atmospheric lidar, a cloud profiling radar with Doppler capability, a multi-channel imager and a broad-band radiometer. Co-located measurements from these instruments are processed in the ground segment, which produces and distributes a wide range of science data products. As well as the L1 product of each instrument, a large number of multiple-instrument L2 products have been developed, both in Europe and Japan, taking benefit from the data synergy. An end-to-end simulator and several test scenes have been developed that simulate EarthCARE observations and provide a development and test environment for L1 and L2 processors.

Within this paper the EarthCARE observational requirements are addressed. An overview is given of the space segment with a detailed description of the four science instruments, demonstrating how the observational requirements will be met. Furthermore, the elements of the Space Segment and Ground Segment that are relevant for the science data users are described and the data products are introduced.

Not yet published paper from Eisinger has been removed from References.