Development of Multi-Sensor Global Cloud and Radiance Composites for DSCOVR EPIC Imager with Subpixel Definition

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The Deep Space Climate Observatory (DSCOVR) enables accurate, clear imagery of the Earth such as could be captured by the relatric Earth Polychromatic Imaging Camera (EPIC) and National Oceanic and Atmospheric Administration (NOAA) satellites. EPIC delivers high-quality solar radiation images of the Earth in 15 spectral channels (0.4–2.3 μm) daily, while NOAA monitors the state of the climate (0.6–0.7 μm) whole disk imagery at high, intermediate, and low resolutions.

Clouds are complex, three-dimensional structures with properties that vary both vertically and horizontally. Cloud properties such as optical depth, cloud effective particle size, skin temperature, and solar and thermal radiances cannot be determined using single methods. These properties are fundamental to understanding climate and weather and can be estimated using radiative transfer models or physical parameterizations.

The DSCOVR EPIC Cloud Retrieval System incorporates a variety of data sources to estimate cloud properties at multiple resolutions with adequate accuracy. The data sources include: MODIS (Level 3), NISTARs, AVHRR, and polar orbiters. The cloud retrieval system uses advanced radiative transfer models and cloud retrieval methods to determine these properties. The cloud retrieval system is optimized for MODIS cloud retrieval methods.

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