

GLOBAL CLOUD PROPERTIES FROM CERES USING VIRS AND MODIS

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The Tropical Rainfall Measuring Mission (TRMM) satellite carries a unique suite of sensors for studying precipitation, clouds, and the Earth's radiation budget. The Clouds and Earth's Radiant Energy System (CERES) project uses two sets of instruments to relate cloud properties to the Earth's radiation fields. The CERES cloud properties also complement the other measurements taken by TRMM and should prove valuable for better understanding of how cloud structure and microphysics relate to precipitation and the hydrological cycle. CERES uses the TRMM multispectral Visible and Infrared Scanner (VIRS) to retrieve cloud properties at a nominal resolution of 2 km and convolve them into the 25-km CERES scanner that measures broadband radiances. The preprocessed TRMM covers all local hours over approximately 1.5 months, but is limited to areas equatorward of 37° latitude. To obtain complete global coverage, the CERES scanners are also flying on the Sun-synchronous Terra satellite. Multispectral 1-km data taken by the Moderate Resolution Imaging Spectroradiometer (MODIS) on Terra are used to retrieve cloud properties for the CERES footprints. CERES has been deriving cloud amount, temperature, height, phase, optical depth, effective particle size, and liquid/ice water path from VIRS data taken since January 1998. The MODIS began operational scanning during Spring 2000. The combination of VIRS and MODIS provide for an unprecedented characterization of global cloud properties and should be valuable for studying hydrological and radiative process as well as evaluating climate model results. This paper presents the first year of results from VIRS and the initial combination of MODIS and VIRS datasets. Uncertainty in the results has been estimated using comparisons with cloud properties derived from surface-based remote sensors. The VIRS-derived cloud products are available to the general scientific community and will soon be followed by those from MODIS.