

RAINFALL RETRIEVAL ALGORITHM USING MODIS CLOUD MASK AND CLOUD PRODUCTS

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Rainfall estimates are necessary in climatological researches, soil moisture budgets, and data assimilation in weather forecasting. Rain measurement by rain gauge is rarely a good representation of a large area and Doppler radar have limited coverage (i.e. radius ~200km). Satellite rainfall estimates for offshore and remote areas are often of low spatial resolution (i.e. TRMM ~27km, TRMM PR ~4km, AMSR-E ~5km). Traditionally, satellite rainfall retrievals are created using microwave bands.

The Moderate Resolution Imaging Spectroradiometer (MODIS) generates Cloud Mask (MOD35) and Cloud (MOD06) products using visible and infrared bands at 1km spatial resolution. This study aims to develop a rainfall retrieval algorithm using MOD35 and MOD06, which can be used for instantaneous rainfall estimation at 1km spatial resolution. This study also explores the use of visible and infrared bands-derived products as an alternative to microwave bands for rainfall retrievals. In this study, cloud mask and optical thickness were used to identify precipitating areas. Cloud water path and effective radius were used to produce rainfall retrieval algorithm with rainfall dataset from the weather stations of the Philippines used as training points. The resulting instantaneous rainfall estimates could provide data for offshore and remote areas with high spatial resolution.

Keywords: cloud, rainfall, MODIS, cloud mask, Philippines