

# Mapping High-Resolution Land Surface Radiation Budget from MODIS: Algorithms and Preliminary Validation Results

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## Abstract

Land surface net radiation, calculated from shortwave and longwave radiative fluxes, is the key component of the surface energy budget that is the core of all land surface process models. There are currently several global radiative flux datasets derived from either satellite observations or global circulation model (GCM) reanalysis, but the spatial resolution (usually  $>1^\circ$ ) and accuracy of these products are not satisfactory for high-resolution modeling and applications.

We have developed a series of algorithms for routinely producing high-resolution land radiative fluxes from Moderate-Resolution Imaging Spectroradiometer (MODIS), including incident shortwave solar radiation (insolation) and photosynthetically active radiation (PAR), shortwave net radiation, longwave downward, upwelling and net radiation, and all-wave net radiation.

This chapter introduces the background, basic principles and procedures of the algorithms, and the preliminary validation results.

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