

Leaf quantity and fAPAR estimation from canopy spectral reflectance in deciduous conifer forest

Koji Kajiwara, Yoshito Nishihara, Yumiko Saito, Yoshiaki Honda
Center for Environmental Remote Sensing Chiba University

Abstract

In order to understand the system of the global carbon cycle, it is required to estimate NPP of forest which is one of stock/source of carbon on land. There is a possibility for estimating the NPP of forests using remote sensing technology by estimating the forest biomass in different terms. However, to actualize developing the estimation method, the estimation model which is based on ground measurement should be established.

In this paper, we describe the method of measuring Leaf Area Index(LAI), fraction of Absorbed Photo Synthetic Active Radiation(fAPAR). Also the developed estimation models of LAI, leaf quantity and fAPAR, which uses spectrum information of reflected light from forest canopy.

Our method has been verified in larch forest located foot of Mt. Yatsugatake in Japan.

Firstly, indirect measurement method for LAI and its verification is introduced. Secondly, leaf quantity estimation method using LAI and canopy spectral reflectance, also its result, is described.

Finally, fAPAR measurement and estimation method and its results are described in the paper.

Through this study, the important parameters for forest biomass estimation, leaf quantity and fAPAR have been estimated successfully by using forest canopy spectral reflectance. The results suggest that the parameters can be estimated from satellite sensor's observation data.