Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

ACG09-26 Room:301B Time:May 28 14:15-14:30

DEVELOPMENT OF AVOBE GROUND BIOMASS ESTIMATION ALGORITHM FOR GCOM-C1/SGLI BASED ON MULTI-ANGLE OBSERVATION DATA

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Japan Aerospace Exploration Agency (JAXA) will launch new Earth observation satellite GCOM-C1 in near future. GCOM-C1 will be equipped Second-generation Global Land Imager (SGLI) as core sensor. Since SGLI can observe nadir and off-nadir angle with along track direction simultaneously, it is expected to retrieve forest Above Ground Biomass (AGB) using bi-directional spectral data.

For the estimation of forest AGB, difference of bi-directional reflectance of each observation angle caused by forest canopy structure will be key information.

Authors have been developed basic AGB estimation algorithm for SGLI. This algorithm is based on the empirical model related to the relationship between reflectance shift on the Red-NIR plane for different viewing angle and AGB.

Since the algorithm requires the bi-directional reflectance on fixed observation geometry, we have also developed bi-directional reflectance simulator, BiRS, which employ not only sun-target-sensor geometry but also forest structure based on canopy structure model.

In this paper, a preliminary result of ARG estimation using MODIS multi-pass composite data is described. Daily TERRA/AQUA MODIS data covering East Asia (8 tiles of MOD09GA/MYD09GA product) during June, July, August of 2010, totally 1472 scene have been processed. In order to obtain the available pairs of nadir and off-nadir viewing data, cloud and aerosol flag were examined and masked unusable pixels that were contain cloud or dense aerosol. For the usable data pair, using the simulator BiRS, satellite observed reflectance converted to estimated reflectance on fixed sun-target-sensor geometry. Using the converted reflectance, AGB on the pixels were calculated. After these processing, all 92 days usable pixels AGB were composited.

Keywords: Above Ground Biomass, BRDF, Optical sensor, GCOM/SGLI