Factors affecting L-band Alos Palsar backscatter on tropical forest biomass

ABSTRACT

Aboveground biomass (AGB) is one of the key parameters for carbon accounting in a forest area. However, estimating this parameter by using remote sensing approach has been challenging as the interpretation of remotely sensed has been challenging as the interpretation of remotely sensed complex tropical forest ecosystem. Synthetic aperture radar (SAR) sensor system has its potential in obtaining acceptable AGB estimation but several issues such as complex forest structure and saturation at certain biomass levels remain unanswered and continuously being studied. This study was carried out to identify factors that contribute to the variation of backscattering properties on forest biomass. The sensitivity of L-band backscatter from Alos Palsar satellite with a wavelength of about 23 cm to the forest biomass was examined. Natural and logged forests of Dungun Timber Complex in Terengganu, Peninsular Malaysia were selected as the study area. AGB at a number of sample plots were measured on the ground in the study area. Both aspects of forestry and remote sensing comprised several variables namely tree allometry, vertical forest strata, tree diameter classes, radar polarimetry, and spatial variability were examined in four experiments. AGB was calculated based on these parameters and tested by using statistical backward elimination method to identify the most significant factor that infer the backscatter. The study revealed that the L-band Alos Palsar backscatter interacts only with canopies of forest at certain size of trees.