ALOS-Indonesia POLinSAR Experiment (AIPEX): Progress Result

Mahmud Raimadoya(1), Bambang Trisassongko(1), Ludmila Zakharova(2) and Nurwadjedi Fahmi(3)

(1) Bogor Agricultural University (IPB), P.O. Box 2049, 16020 Bogor, Indonesia
(2) IRE – Russian Academy of Sciences, Vvedensky sq., 1, Fryazino 141190, Russian Federation
(3) National Mapping Coordination Agency-Bakosurtanal, Jalan Raya Jakarta Bogor Km46, Cibinong, Indonesia

ABSTRACT

The go or no go decision for POLinSAR analysis was based on SAR Calibration exercise by using two level 1,1 PLR-215 imageries of Indonesia (Cycle 10 and 11): ALPSRP0685500000-P1.1A (2007/05/08) and ALPSRP0727300000-P1_A (2007/06/06). The result showed that in general, the JAXA calibration quality of PALSAR/PLR-215 data acquired over Indonesia test site is good for vegetation studies. Furthermore, levels of Faraday rotation in these PALSAR images were small to have a corrupting effect for the goals of AIPEX exercise. Based on this positive outcome, decision to proceed with POLinSAR analysis for tropical forest of Indonesia was taken.

This paper updates the progress on POLinSAR analysis of PLR-215 SLC image pairs in the selected natural tropical forest test sites of Indonesia, by using POLSARPRO version 4 (January 2009). This first local attempt of POLinSAR analysis was implemented on a single-baseline PLR-215 image pair (B-parallel: -1139.26m, B-normal: -1347.76m), of the following path (P) and frame (F) number: P-488, F-30 (dated: 20070311/Slave [ALPSRP060040030] and 20070426/Master [ALPSRP066750030]). Despite of temporal decorrelation issue due to 46 days ALOS orbit cycle, this exercise shown that processing chain of POLinSAR analysis could be completed as expected. Although it only derived forest height instead of tree height, this progress provided the opportunity to measure height in tropical forest application. However, further improvement of POLSARPRO is required, to display the measurement profile in ground range rather than in slant range as given the existing version. The coverage gap of PLR-215 acquisition geometry in the equator is another problem for operational use. JAXA introduction of PLR-231 in Cycle 27 (April, 2009) is expected to overcome this situation. Nevertheless, the good result on calibration and Faraday rotation, including successful progress on POLinSAR analysis, will be a good starting indication for future operational application of full polarimetry space-borne SAR in the tropical forest of Indonesia.