

Japan - Indonesia Pi-SAR-L2 Campaign in 2012

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Abstract: Japan Aerospace Exploration Agency (JAXA) and Ministry for Research and Technology of Indonesia (RISTEK) have jointly conducted the L-band airborne SAR flight campaign in Indonesia between Aug. 5 and Aug. 8 of 2012. The SAR involved in this campaign is the JAXA's Polarimetric Interferometric Airborne Synthetic Aperture Radar of L-band version 2, shortly Pi-SAR-L2, which was developed to replace and improve the previous Pi-SAR-L for calibration and validation of the ALOS-2/PALSAR-2 and the future SAR investigations by the end of March 2012. Application of the Pi-SAR-L2 in Indonesia focused on the specific mission objectives important to both countries, i.e., forest observation, disaster observation, marine applications (ship detection), geometric evaluation, and the crop monitoring.

Among four representative frequencies, i.e., L-S-C-X-P-band, L-band is the lowest frequency with limited bandwidth of up to 85MHz but superior performance of the signal penetration through the vegetation of forest canopy- resultantly the interferometric coherence and the phase information can be significantly linked with the temporal variation of the target, i.e., change detection of the target.

Here, we describe the overview of the experiment and the outcome as follows;

- 1) Pi-SAR-L2: Calibration and Validation of the SAR was conducted especially to investigate the characteristics of the L-band signal scattered from the forest, Sea-surface, land covers.
- 2) Forest Observation: BY defining the test sites in the Riau province of the Sumatra, we have obtained the two data forest data, one of which covered several of the forest types, i.e., natural forest, acacia, oil palm, rubbers, etc., The other type of the flight are the interferometric flights in the natural forest area to investigate the interferometric performance of the forest-InSAR applications.
- 3) Disaster observation: Krakatau and the Gamalama volcanoes were conducted.

Observation was only the one time and it could not give us the temporal variation of the surface change. However, it gave the surface structure of the volcanic mouth.

- 4) Map generation: To investigate the application of the SAR map, we generated the ortho-map of the Pi-SAR-L2 using the ALOS/PRISM-DSM. We processed the some sample images at the Semarang, Java.
- 5) Final theme is the crop monitoring: This monitoring was conducted jointly with the Jaxa and the member of the Indonesian team. The test site was the Central Kalimantan and Subang, Java.

Now, all the Pi-SAR-L2 data were processed correctly and are used for the investigations in each research theme. In this presentation, we will show the summary of the project and the outcomes.

Keyword: Pi-SAR-L2, SAR, Calibration and Validation, Forest Monitoring, Disaster Monitoring, Map generation, Ship Detection, Crop Monitoring