



ALOS-2 status update for K&C 2019 meeting

Shinichi Sobue

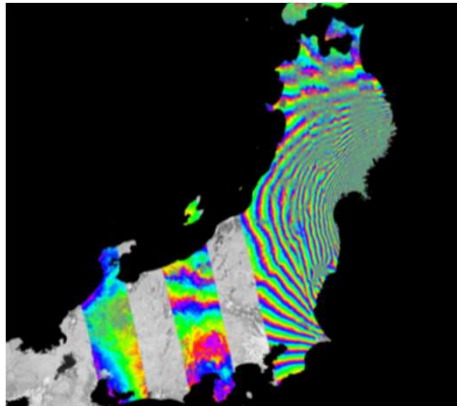
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ALOS-2 Project Manager

Japan Aerospace Exploration Agency
February 5, 2019

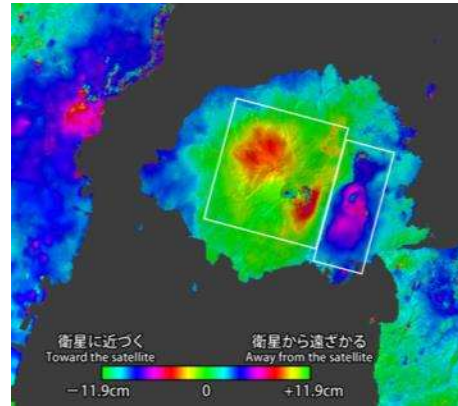
Mission Objectives:

Disaster monitoring

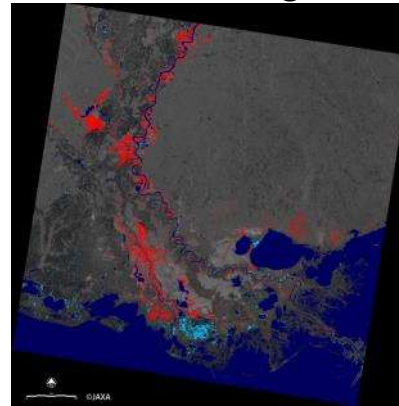
Earthquake



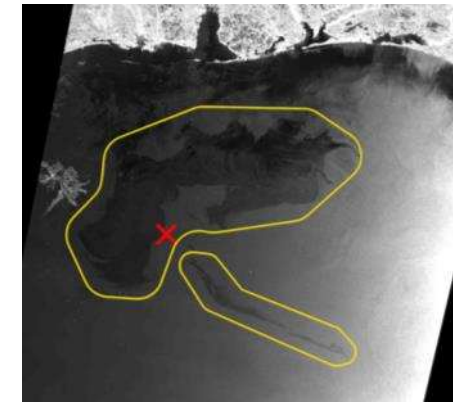
Volcano



Flooding



Ocean

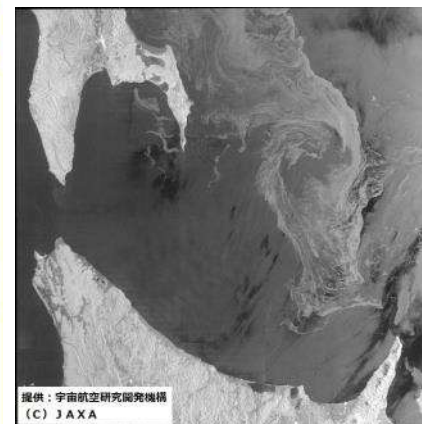


Environment and land management

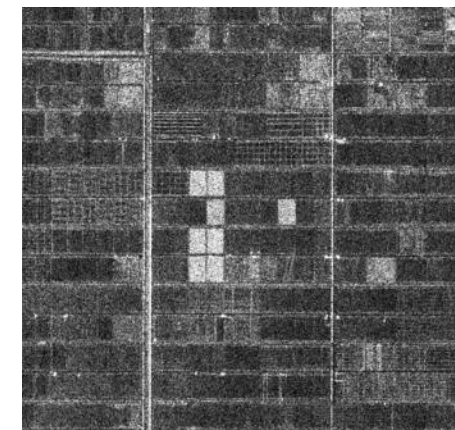
Forest and wetland



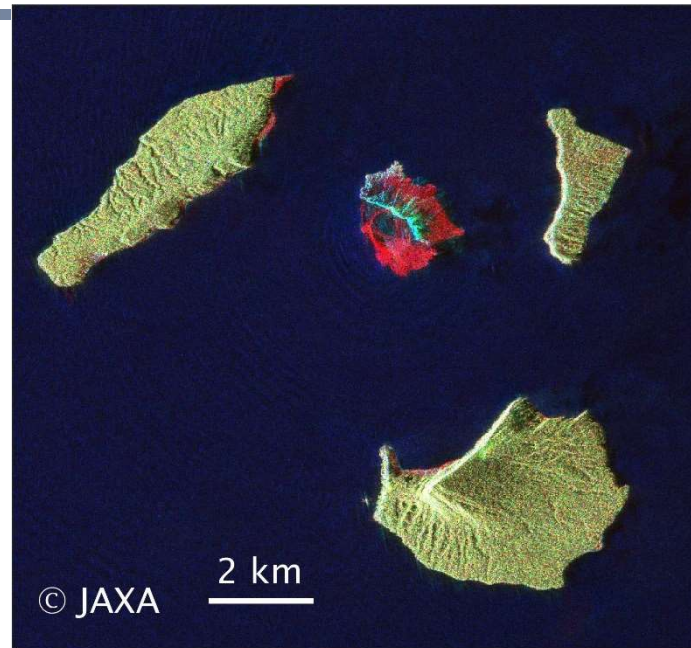
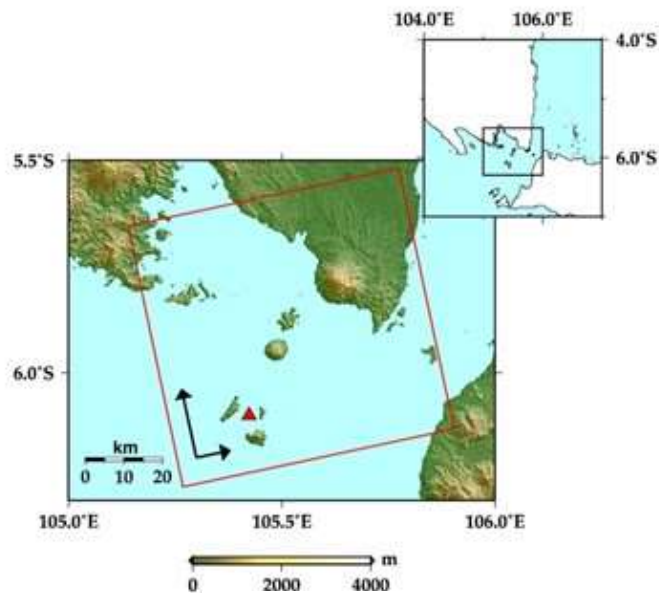
Ice



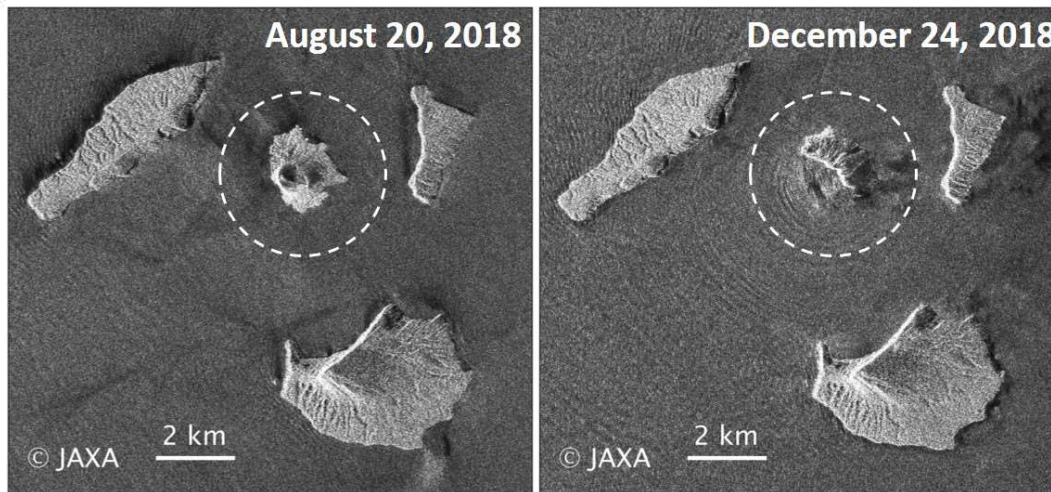
Agriculture & natural resources



Monitoring eruption of Anak Krakatau Volcano in Indonesia on December 22, 2018



Polarimetric color-composite image (red: August 20 HV polarization, green: December 24 HV pol., blue: December 24 HH pol.),

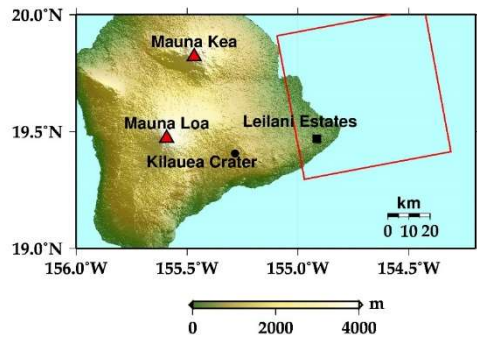


Comparison of the two HH amplitude images acquired before (August 20, 2018) and after (December 24, 2018) the eruption. The white-dotted circle shows Anak Krakatau Island.

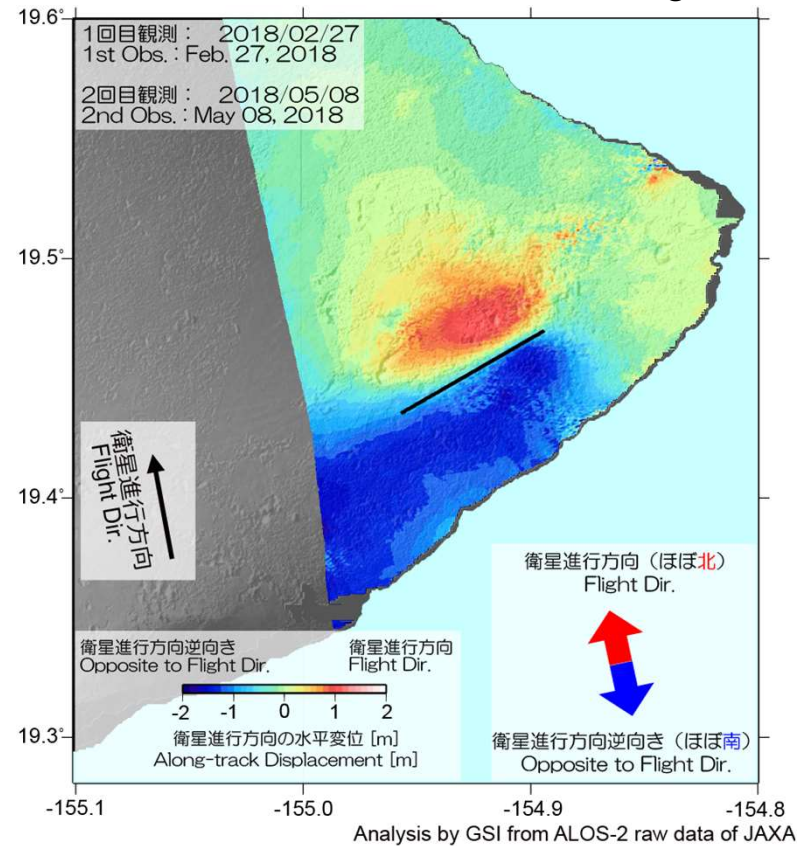
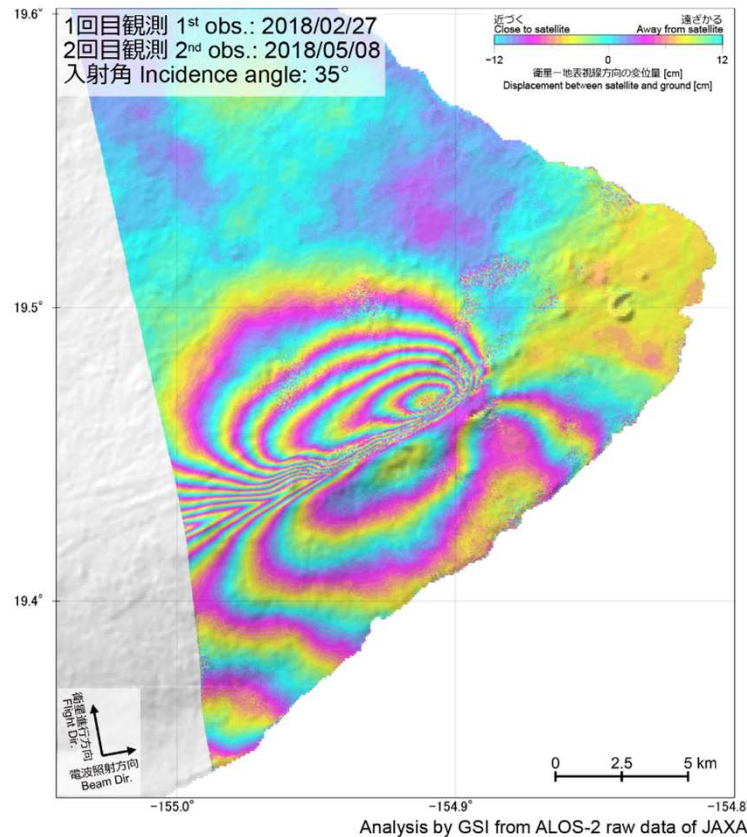
The results obtained from the data are summarized as follow by GSI.

- We can observe the clear geomorphic change in the southwestern part of the Anak Krakatau volcano. It can be estimated that approximately 2 km squares of southwestern part of the island was collapsed by December 24th at 5 pm (UTC).

Monitoring Eruption of Mt. Kilauea and Earthquake in Hawaii



- ✓ Mt. Kilauea in Hawaii Island has erupted since May 3.
- ✓ ALOS-2 performed emergency observations on May 8, 12, 17 and 22, 2018 (UTC).
- ✓ ALOS-2 detected the displacement occurred by eruption and earthquake:
 - ✓ 0.7 m displacement toward the flight direction and 2 m toward the reverse direction of ALOS-2 for 10 km in length.

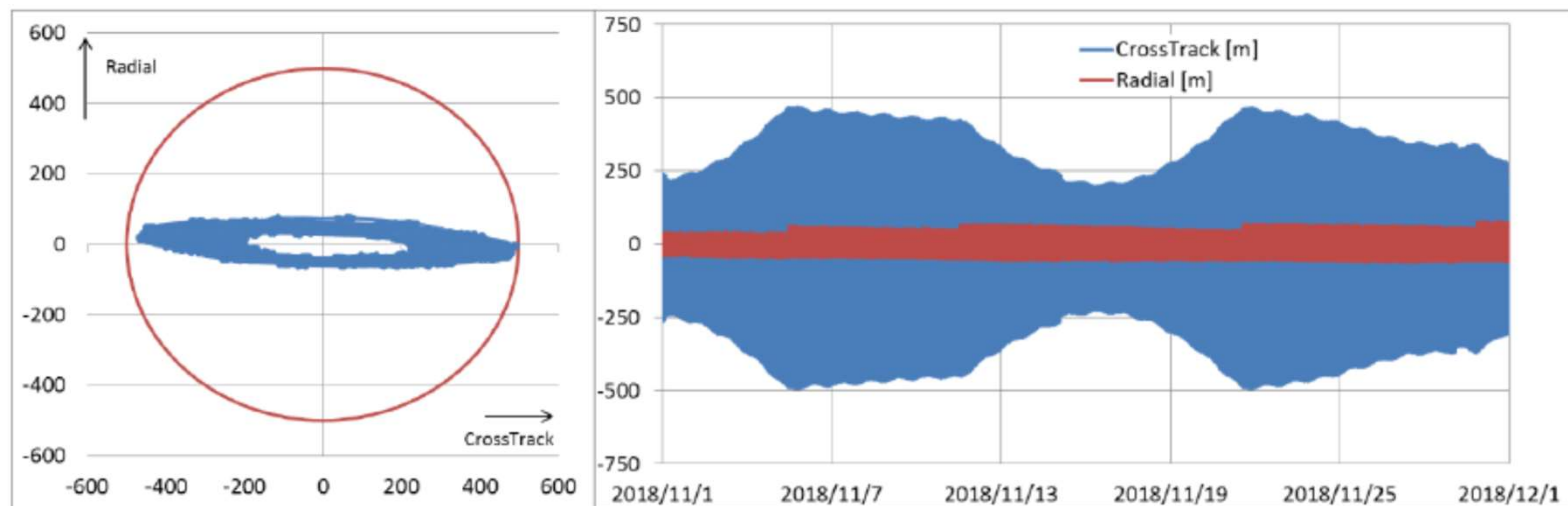


Multiple Aperture Interferometry image of the ALOS-2 PALSAR-2 data
Analyzed by Geospatial Information Authority of Japan

Satellite system and operation status



- **ALOS-2 system is green**
- **Will complete nominal operation period in May, 2019 and will operate as extended operation period to go forward to ALOS-2/ALOS-4 constellation operation after having a nominal operation phase review meeting**



- **As the results of autonomous orbit control, the success rate of the orbit control is over than 99%.**

ScanSAR ATT change from 25 db to 20db

From April, 2018

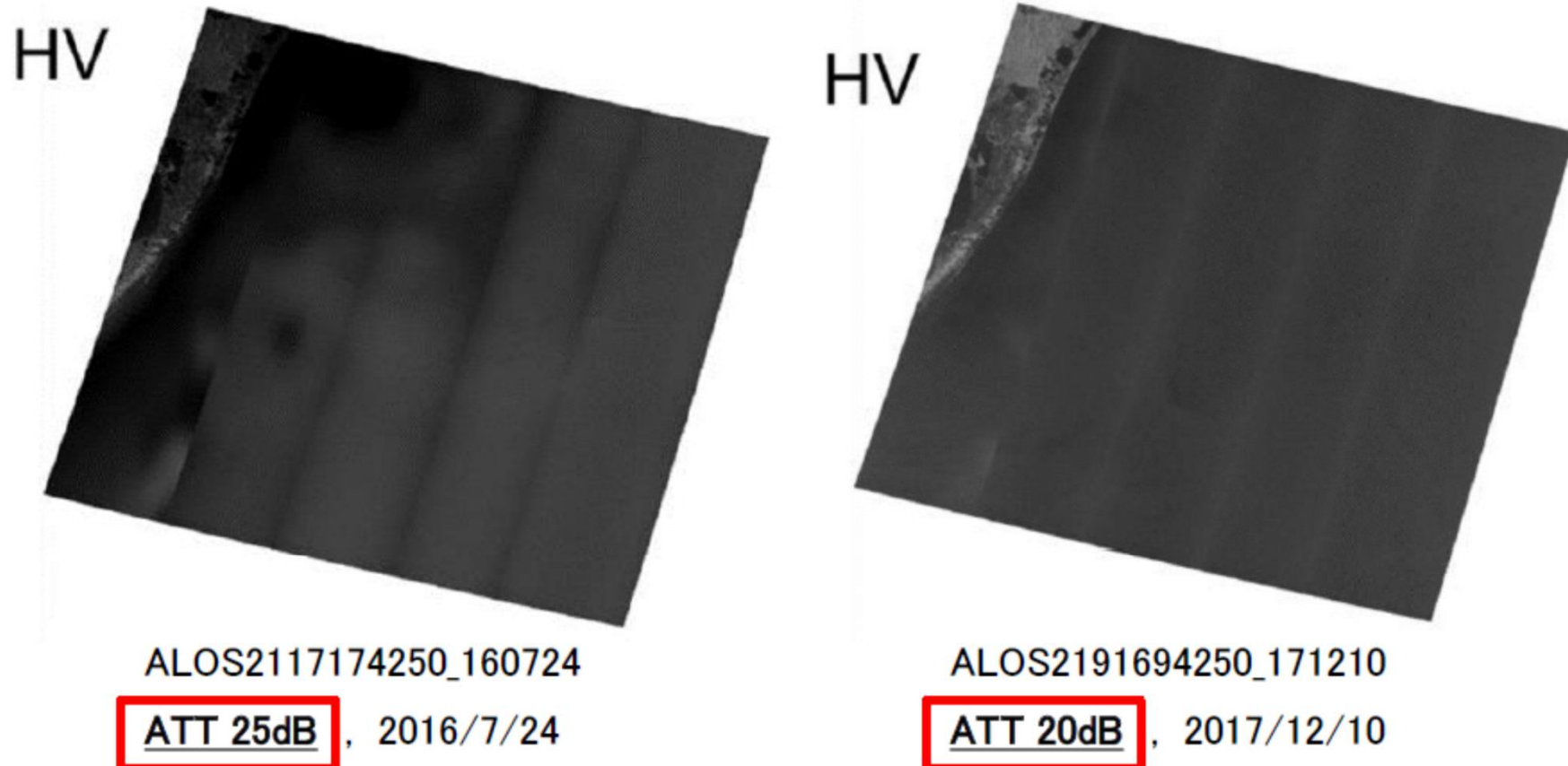


図 L1.5画像のATT量設定変更前後の比較

Correction of the range offset error in November 22, 2018



Confirmed that the range offset error disappeared after the update. For products ordered after the update on November 20 (JST), we provide a product with the range offset error is resolved.

The observation modes that may be influenced by the range offset error are as follows.

Stripmap [10 m], ScanSAR [350 km] 14 MHz / 28 MHz, ScanSAR [490 km]

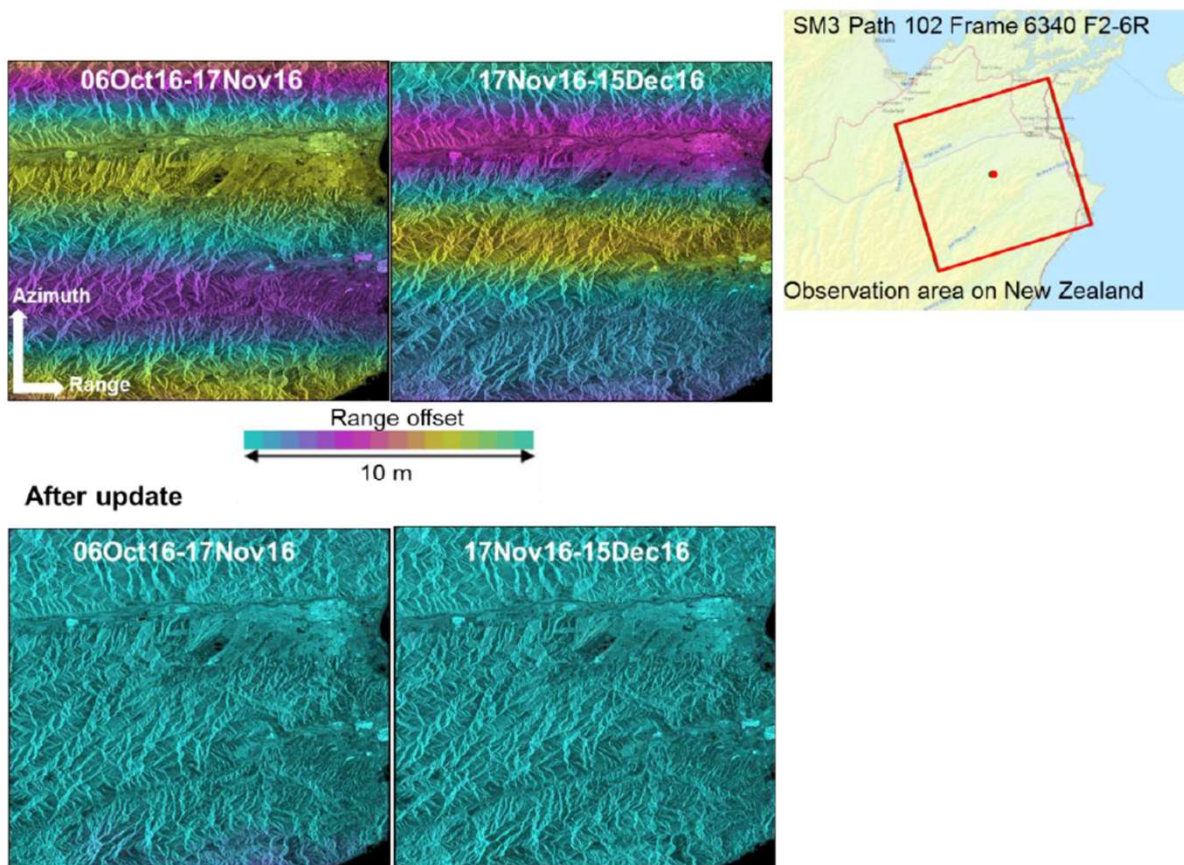


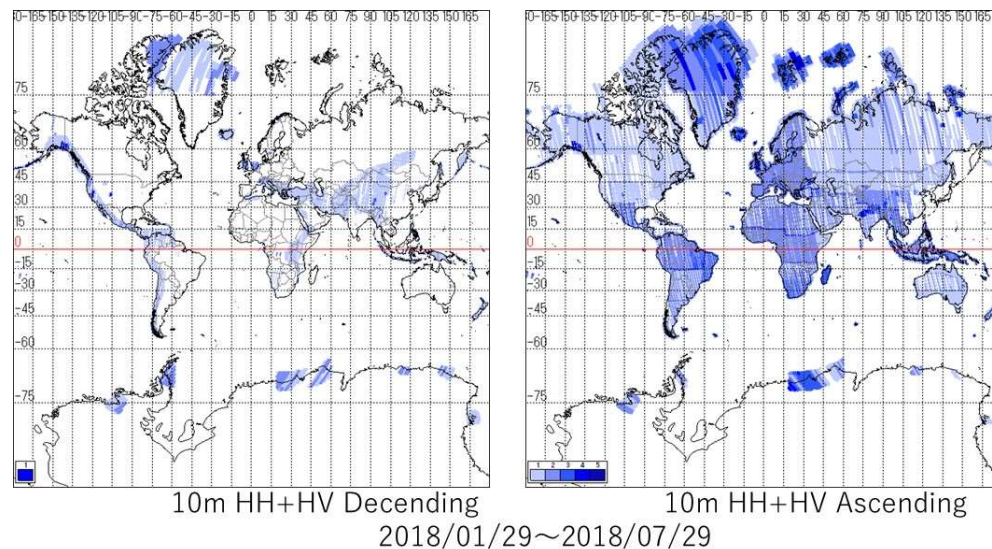
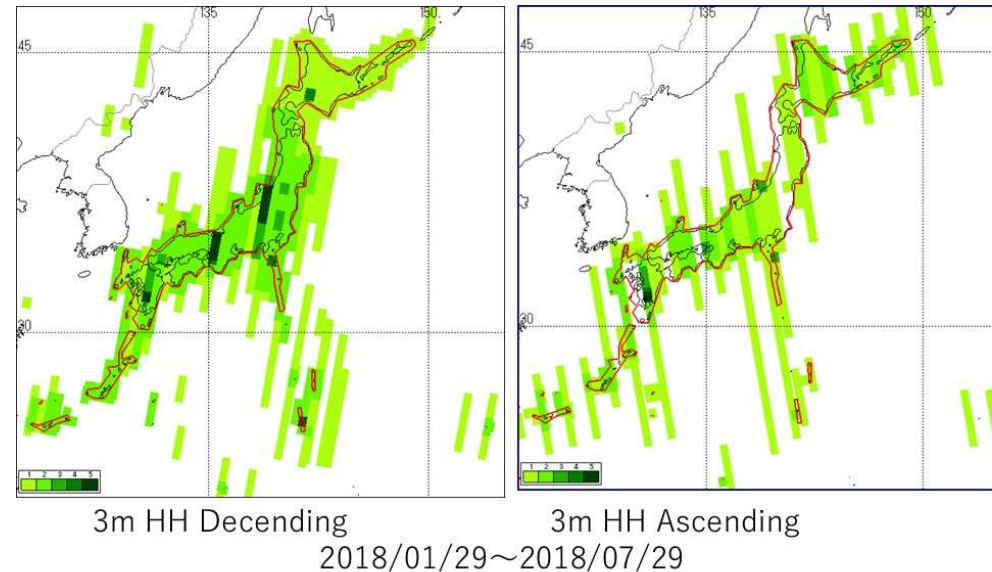
Figure: Comparison of the range offset images before and after update.

Observation results in 6 months



Continuous observation based on BOS

- Global 10 m dual pol. observation
- Japan area 3m observation
- ScanSAR 100m dual pol. Observation
- Intensive observation to disaster monitoring and other applications in super sites
- Bilateral cooperation observation with JICA-JAXA (JJ-FAST), Canada, Italy, etc.



Promotion of PALSAR-2 ARD for the Application Into Rice Crop Monitoring

- Interests in the use of PALSAR-2 ARD data for the practical application from Vietnam, Indonesia, and Thailand

@ co-organized meeting by ASEAN Food Security Information System (AFSIS) and JAXA in March 2017



- Exchange of memorandum of understanding (MOU) on ARD
 - with Vietnam: VNSC
 - with Indonesia: LAPAN
 - With Philippine: DOST



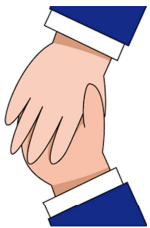
- And demonstrate rice crop application and others using ARD for Mekong region in cooperation with VNSC as CEOS2019 chair

Agreement between VNSC and JAXA

Purpose:

To set forth cooperation between the Parties for satellite data exchange to support the DataCube Program in Vietnam in order to promote practical use of satellite data (e.g. on Rice, Forests etc.) by the Vietnam government.

Responsibilities



- To develop, operate and maintain DataCube to archive ALOS-2 ScanSAR data and promote practical use of ALOS-2 data in the Vietnam government.
- To implement research, application development and promotion using EO products, including Japanese L-band and other satellite data and ground data, in the DataCube environment for Vietnam government use, in cooperation with JAXA and related Vietnam organizations
- To send JAXA annual report on the governmental use of data and accomplishment of ALOS-2 with providing a feedback of ALOS-2 data usage.

- To provide ALOS-2 ScanSAR product of Vietnam area in order to support the implementation of DataCube Program in Vietnam and for government use. The product will be derived from JJ-FAST.
- To provide ALOS-2 standard products up to 50 scenes per year for each research theme that are mutually agreed by JAXA and VNSC.
- To cooperate in research, application development using EO products, including Japanese ALOS-2 and other satellite and ground base data, in the DataCube environment for Vietnam government use.

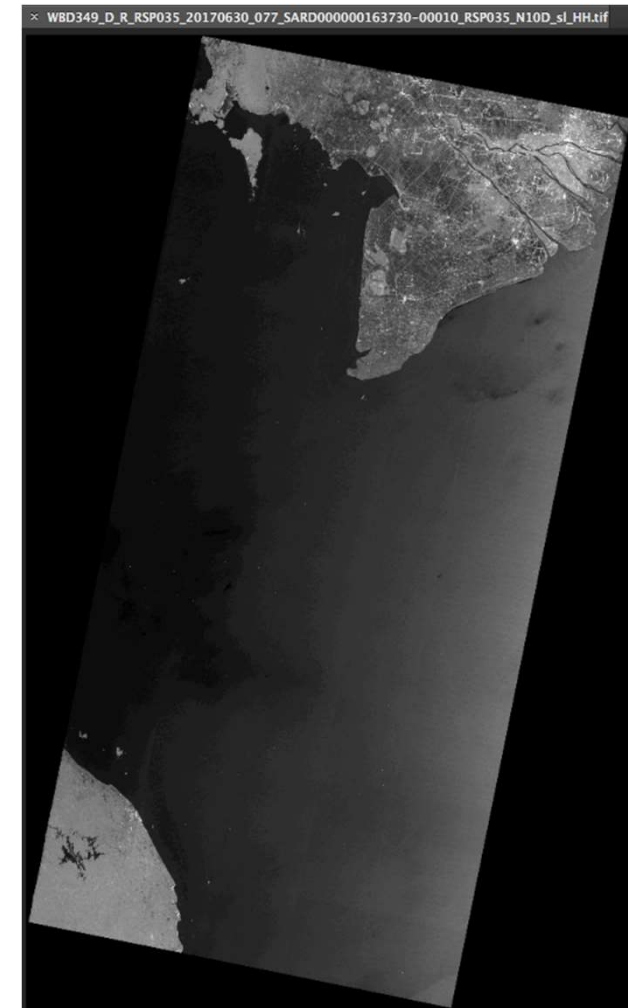
ARD – ALOS-2 ScanSAR data provision (JJ-FAST intermediate products by JICA-JAXA)

Product characteristics

- Path data
- Polarisation: HH + HV
- Gamma-0
- Image size: arbitrary
- Pixel spacing: 50 m
- Image segment start & end: arbitrary
- Orho & slope correction by SRTM1
- Data type: 16 bits Units
- File format: GeoTIFF
- **Temporal resolution: 42 days**
- **Spatial resolution: All paths in target region**

Limitations:

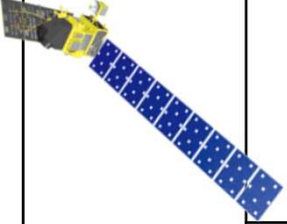



- **ASEAN countries**
- **For governmental users only**



PALSAR-2 ScanSAR (HH)
30 June 2017



Schedule of routine data processing

		2018				2019			
		1Q Jan Mar	2Q Apr Jun	3Q Jul Sept	4Q Oct Dec	1Q Jan Mar	2Q Apr Jun	3Q Jul Sept	4Q Oct Dec
 ALOS	AVNIR-2 (10m)	▲ Japan Area			▲ ±60 Degree Area				▲ Global
	PALSAR (10m)				▲ Japan Area		▲ ±60 Degree Area		▲ Global
 ALOS-2	ScanSAR (100m)	 JICA-JAXA JJ-FAST intermediate products (ARD)							
	Fine Mode (10m)				Under negotiation with PD				 Data Processing

Continuous Observations by ALOS Series

- ✓ Assurance of safety and security of citizens, *i.e.* disasters monitoring and management, land deformation monitoring, national developing management, foods and natural resources, environmental issues in global etc.
- ✓ Enhancement of commercial use of Earth observation data, *i.e.* National Spatial Data infrastructure (NSDI) and new applications.



ALOS-2 operation summary

- Will complete ALOS-2 nominal operation in this May and have a nominal operation phase review to go forward extend mission
- Need to show outcome and accomplishment from science and applications to secure extend ALOS-2 operation to have ALOS-2 / ALOS-4 constellation observation operation
- Two modification: L1 S/W improvement to range offset and ScanSAR ATT change (25->20)
- Revise ALOS-2 BOS to have long ALOS-2 life with reducing duty cycle from 50% to 30%.
 - Global 10m observation (at least once a year with high priority to support mission success criteria)
 - Prioritize intensive bi-weekly observation to show more outcome of L-SAR and L-SAR with other observations (X/C/S) and optics as well as big data analysis
- Produce all ALOS/PALSAR L1.1 and L2.2 and all ALOS-2/ScanSAR L1.1 and L2.1 to post Japanese governmental platform from next year.
- Appreciate your patience to use ALOS-2 AUIG2 to search and order with limited number of scenes per an order