APPENDIX 6

OVERVIEW OF THE ADVANCED LAND OBSERVING SATELLITE-4 (ALOS-4) MISSION

1. Introduction

The Advanced Land Observing Satellite-4 (ALOS-4) will observe the Earth's surface using its onboard the Phased Array type L-band Synthetic Aperture Radar-3 (PALSAR-3). The data will be utilized for monitoring disaster, forest, sea ice, infrastructure, and many other applications with the advantages of Synthetic Aperture Radar (SAR) such as all-weather and day-and-night observation capability. With further improved observation performance compared to the predecessor PALSAR-2 aboard ALOS-2, the satellite aims at achieving both high resolution and a broader observation swath.

ALOS-4 is equipped with a SAR antenna at the lower part of its body and with two solar array paddles at both sides, as shown in Figure 1. The observation data is transmitted to a ground station via. Ka-band data downlink with maximum rate of 3.6 Gbps. ALOS-4 will operate in the same orbit plane as ALOS-2. Table 1 shows system specifications of ALOS-4.

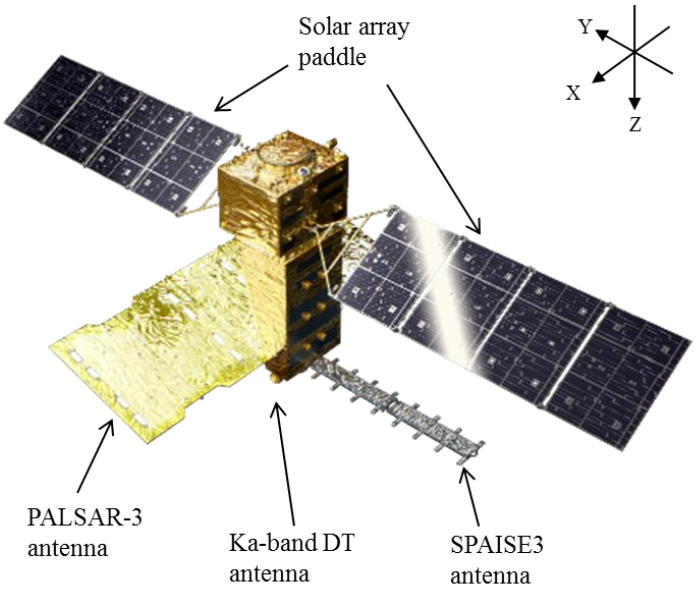

Fig. 1 ALOS-4 in-orbit configuration.

Table 1 ALOS-4 current specifications (under designed).

Mission Instruments	・ PALSAR-3 (Phased Array-type L-band Synthetic Aperture Radar-3) ・ SPAISE3 (SPace based AIS Experiment 3)
Orbit	・ Sun-synchronous sub-recurrent orbit ・ Altitude: 628 km ・ Inclination angle: 97.9 degree ・ Local sun time at descending: 12:00 ± 15 min. ・ Revisit time: 14 days (15-3/14 rev/day) (Same orbit as ALOS-2)
Mission lifetime	7 years
Satellite mass	Approx. 3 tons
Data downlink	3.6 Gbps/1.8 Gbps (Ka-band)

2. PALSAR-3 Specification

ALOS-4 carries the state-of-the-art L-band SAR called PALSAR-3. For the continuity of ALOS-2 data, PALSAR-3 will inherit the major function and performance (NESZ, S/A, etc.) of PALSAR-2 aboard ALOS-2. The observation swath width of PALSAR-3 will be expanded from PALSAR-2 without spoiling the spatial resolution by using the digital beam-forming (DBF) technique.

Fig. 2 and Table 2 show geometries and specifications of PALSAR-3, respectively. Spotlight and Stripmap modes will provide high resolution data. ScanSAR mode will observe wider area with 700 km swath width at the expense of spatial resolution. The observation repetition frequency of ALOS-4 will also be improved owing to the expanded swath width.

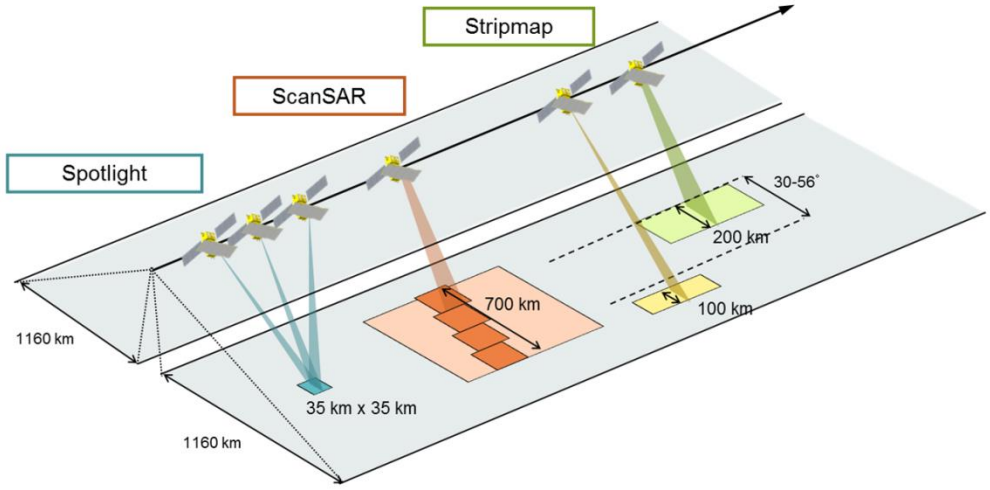

Fig. 2 Geometry of PALSAR-3 observation modes.

Table 2 PALSAR-3 observation modes and specifications.

Observation mode	Spotlight	Stripmap 3m		Stripmap 6m		Stripmap 10m		ScanSAR
SAR mode	Sliding-spotlight	Stripmap						ScanSAR
Center frequency (MHz)	1257.5	1257.5		1236.5 or 1257.5 or 1278.5				
Bandwidth (MHz)	84	84		42		28		28
Resolution (m)	3 x 1 (Rg x Az)	3		6		10		25 (1 look)
Swath width (km)	35 x 35 (Rg x Az)	200	100	200	100	200	100	700 (4 scan)
Polarization (HV basis)	1, 2	1, 2	1, 2, 4	1, 2	1, 2, 4	1, 2	1, 2, 4	1, 2
Incidence angle range (degree)	8-70	30-56	8-70	30-56	8-70	29-56	8-70	8-70
Split-band option (for ionospheric correction)	N/A	N/A	N/A	N/A	N/A	28+10 MHz	N/A	N/A

*Items in red color represent improvements or modifications from PALSAR-2

3. Standard Product

PALSAR-3 Standard Data Products (Level 1) are radiometrically and geometrically calibrated data and will be provided for ALOS-4 users. Table 3 shows the definitions of the Standard Data Products. In addition, higher-level data products including global mosaic and disaster map are planned to be released.

Table 3 PALSAR-3 standard data procucts.

Level	Definition
1.1	Range and azimuth compressed single-look complex (SLC) data on slant range
1.5	Geo-coded or geo-referenced amplitude image projected to map coordinate
2.1	Ortho-rectified amplitude image projected to map coordinate