ALOS-4
Request for Mission Support

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ALOS-4 Mission Overview

Advanced Land Observing Satellite-4

- Observing the Earth's surface using its onboard phased array type L-band synthetic aperture radar (PALSAR-3)
  - Further improved observation performance compared to the predecessor PALSAR-2 aboard the ALOS-2; both higher resolution and broader observation swath
- Monitoring oceans by receiving AIS signals from vessels as well as by acquiring the PALSAR-3 images
  - Effective countermeasures against radio wave interference regions are taken for the SPace based AIS Experiment (SPAISE3) with multiple antennas and groundbased data processing
- Plan to launch in JFY2022
  - Postponed from JFY2021 to JFY2022 (due to change of schedule for the H3 launch vehicle)

Observation Swath (ALOS-2 / ALOS-4)	
Stripmap mode (Resolution 3 m, 6 m, 10 m)	50 km, 70km / 100km - 200 km
ScanSAR mode (Resolution 25 m)	350 km, 490 km / 700 km
Spotlight mode (Resolution 1 m x 3 m)	25 km x 25 km / 35 km x 35 km
Observation Frequency @Japan (ALOS-2 / ALOS-4)	
Stripmap mode (Resolution 3 m)	Four times a year / Once every two weeks

General Characteristics	
Sensor system	PALSAR-3*, SPAISE-3**
Operational orbit	Sun-synchronous sub-recurrent
Orbit altitude	Approx. 628 km (same as ALOS-2)
Spacecraft size	10.0 m (D) x 20.0 m (W) x 6.4 m (H)
Spacecraft mass	Approx. 3,000 kg
Design life	7 years

*PALSAR-3:phased array type L-band synthetic aperture radar
**SPAISE-3:Space-based Automatic Identification System Experiment

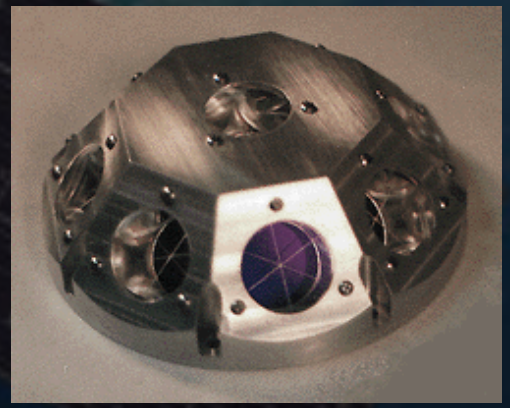
Necessity of SLR Tracking

Precise Orbit Determination (POD)

- SAR Interferometry depends on the accuracy of orbits
  - Mission requirement for orbit accuracy < 10 cm (RMS)
- GPS antennas and receivers will be onboard
  - Pseudorange and carrier phase observations of L1 and L2 signals
- The LR will be onboard
  - The same type LR as ADEOS-2's one
- SLR observations will be;
  - primarily used as independent validation and quantification of GPS based-POD
  - also used for POD in combination with GPS data

✓ SLR tracking must be essential for mission success

LR specification	
Manufacturer	KBRwyle
Type of Array	Hemispherical / Pyramid
Dihedral Angle Offset	1.5 arcsec
Flatness of Cube's Surface	1/10 th wavelength 5320 angstroms
Size of LR	ϕ160 mm x 65 mm
Optical Cross Section	5×10^5 m^2
Number of CCR	9 (1 center + 8 surroundings)



LR for ADEOS-2 @HTSI

Request for Mission Support

Mission Campaign and Restricted Tracking

- JAXA asks favor about ILRS Mission Campaigns
  - Observations more than 100 passes will be expected in two weeks at early operation phase for evaluation and calibration of GPS based-POD
  - If needed (depending on results of above), JAXA may request 2nd campaign
- Restricted Tracking is necessary during maneuvers (Autonomous orbit control)
  - For avoidance of damage to STT
  - Using go/nogo key would be the best way

✓ ILRS support will be strongly appreciated

Future Plan

General Procedure

- Submission of Mission Support Request Form in 2020 or early 2021
  - As soon as the form is ready, prior enough to the launch
- Discussion of restricted tracking with SLR stations
- Test and rehearsal for tracking restriction (and provision of CPF)