ALOS-2 status and Acquisition Strategy Update

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on behalf of
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CEOS SDCG#2
USGS HQ, Va/USA, Sept 13-14 2012
ALOS-2 Basic Observation Scenario

ALOS-2 satellite
- Launch: 2013
- Orbit type: Sun-synchronous
- Altitude: 628 km +/- 500 m (for reference orbit)
- Revisit time: 14 days
- LSDN: 12:00 +/- 15 min

PALSAR-2
- L-band Synthetic Aperture Radar
- Active Phased Array Antenna type
two dimensions scan (range and azimuth)
- Antenna size: 3m (El) x 10m (Az)
- Bandwidth: 14 – 84 MHz
- Peak transmit Power: 5100W
- Observation swath: 25 – 490 km
- Resolution: Range: 3 m to 100 m
  Azimuth: 1 m to 100 m

Solar paddles

SAR antenna
# PALSAR-2 Specifications

<table>
<thead>
<tr>
<th></th>
<th>Spotlight</th>
<th>Ultra Fine</th>
<th>High sensitive</th>
<th>Fine</th>
<th>ScanSAR nominal</th>
<th>ScanSAR wide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth</td>
<td>84MHz</td>
<td>84MHz</td>
<td>42MHz</td>
<td>28MHz</td>
<td>14MHz</td>
<td>28MHz</td>
</tr>
<tr>
<td>Resolution</td>
<td>Rg × Az: 3m × 1m</td>
<td>3m</td>
<td>6m</td>
<td>10m</td>
<td>100m</td>
<td>60m</td>
</tr>
<tr>
<td>Swath</td>
<td>Rg × Az: 25 × 25km</td>
<td>50km</td>
<td>50km</td>
<td>70km</td>
<td>350km (5-scan)</td>
<td>490km (7-scan)</td>
</tr>
<tr>
<td>Polarization</td>
<td>SP</td>
<td>SP/DP</td>
<td>SP/DP/QP/CP</td>
<td>SP/DP</td>
<td>SP/DP</td>
<td>SP/DP</td>
</tr>
<tr>
<td>NESZ</td>
<td>-24dB</td>
<td>-24dB</td>
<td>-28dB</td>
<td>-26dB</td>
<td>-26dB</td>
<td>-23dB</td>
</tr>
<tr>
<td>S/A Az</td>
<td>20dB</td>
<td>25dB</td>
<td>20dB</td>
<td>23dB</td>
<td>20dB</td>
<td>20dB</td>
</tr>
</tbody>
</table>

SP : HH or VV or HV , DP : HH+HV or VV+VH , FP : HH+HV+VH+VV , CP : Compact pol (Experimental mode)

**Main applications:**
- **Fine beam (DP):** Forest and land cover monitoring / DinSAR
- **ScanSAR (DP):** Rapid deforestation / wetlands / InSAR (ScanSAR-ScanSAR)
- **Spotlight (SP):** Emergency observations
- **Ultra Fine (SP):** Global map, InSAR base mapping
- **High sensitive (QP):** Global map
- **ScanSAR wide (SP):** Polar ice
ALOS-2 status

- ALOS-2 is planned for launch in 2013, with a design lifetime of 7 years.

- A global systematic acquisition strategy ("Basic Observation Scenario" – BOS) is under development.

- The ALOS-2 BOS builds on the ALOS acquisition strategy (2006-2011). It will provide continuity of key acquisitions but with enhanced image characteristics (spatial resolution, polarisations, radiometric sensitivity).

- The ALOS-2 Data Policy is yet to be determined.
The ALOS-2
Basic Observation Scenario (BOS)
(as of September 2012)
Summary of BOS:

- Global land areas – baseline mapping (10m; 2/yr)
- Global land areas – VHR baseline mapping (3m; 1/3yr)
- Global land areas – Polarimetric baseline (6m; 1/3yr)
- Forest monitoring (10m; 2-6/yr)
- Wetlands & Rapid deforestation monitoring (100m; 9/yr)
- Crustal Deformation (10m; 2-6/yr; 100m; 9/yr)
Polar Ice

Temporal repeat: 3 cov/year

GSD: 100 m

Mode: WB (HH or HH+HV) (TBD)
Glacier movement (Super Sites)
Temporal repeat: 2-3 cov/year
GSD: 10 m
Mode: SP (HH)
### ALOS-2 Basic Observation Scenario

Observation pattern for annual acquisitions *

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual</th>
</tr>
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<tbody>
<tr>
<td>Week of year</td>
<td>2</td>
</tr>
<tr>
<td>Cycle</td>
<td>58</td>
</tr>
<tr>
<td>Deso D+W+F</td>
<td>D+W+F</td>
</tr>
<tr>
<td>WB 100m</td>
<td>WB 100m</td>
</tr>
<tr>
<td>Asc</td>
<td>North Pole</td>
</tr>
<tr>
<td>WB(R)</td>
<td>DP 10m</td>
</tr>
</tbody>
</table>

* 3m SP and 6m QP modes require 3 years for global coverage
Schedule

2011-2012: Observation plan development with associated software simulations to optimise data collection versus recording and downlink capacity and use of other system resources (power, etc.)

2013: BOS implementation and satellite launch

L + 2.5 m: BOS operations starting

L + 7 m: Start of distribution of standard products

2013+: The BOS plan will be reviewed on a regular basis (ALOS: 2 times/year) by JAXA and related Japanese institutions, and refined/modified as required.
Thank you

ありがとう。
Global land areas – baseline mapping
Temporal repeat: 2 cov/year
GSD: 10 m
Mode: Dual-pol (HH+HV)
Global land areas – VHR baseline mapping

Temporal repeat: 1 cov/3 years

GSD: 3 m

Mode: Single-pol (HH or HV) (TBD)
Global land areas – Polarimetric baseline

Temporal repeat: 1 cov/ 3 years

GSD: 6 m

Mode: Quad-pol (HH+HV+VV+VH)
Forest monitoring

Temporal repeat: 2-6 cov/year (tropics 6 cov)

GSD: 10 m

Mode: Dual-pol (HH+HV)
Wetlands & Rapid deforestation monitoring

Temporal repeat: 9 cov/year

GSD: 100 m

Mode: WB-350km (HH+HV)
Crustal Deformation

Temporal repeat: 2-6 cov/year & 9 cov/year

GSD: 10 m & 100 m

Mode: Dual-pol (HH+HV) & WB-350km (HH+HV)
## ALOS-2 Basic Observation Scenario

Pattern repeated on a 3-year basis

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
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<tbody>
<tr>
<td><strong>Week of year</strong></td>
<td><strong>Desc</strong></td>
<td><strong>Asc</strong></td>
<td><strong>Desc</strong></td>
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<tr>
<td>2</td>
<td>D+WF</td>
<td>Def</td>
<td>D+WF</td>
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<tr>
<td>4</td>
<td>14-day InSAR</td>
<td>Glacier</td>
<td>14-day InSAR</td>
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<tr>
<td>6</td>
<td>DP 10m</td>
<td>Global (1/3)</td>
<td>DP 10m</td>
</tr>
<tr>
<td>8</td>
<td>WB 100m</td>
<td>WB 100m</td>
<td>WB 100m</td>
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<tr>
<td>10</td>
<td>DP 10m</td>
<td>DP 10m</td>
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<tr>
<td>12</td>
<td>WP 100m</td>
<td>WP 100m</td>
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<tr>
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<td>Q6 6m</td>
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<tr>
<td>52</td>
<td>SP 10m</td>
<td>SP 10m</td>
<td>SP 10m</td>
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Emergency observations
Emergency observations – such requested through the International Disaster Charter, by Japanese institutions or by JAXA itself – have highest priority and superseed the Basic Observation Scenario programming.

Cal/Val
Requests related to Cal/Val also have higher priority than the BOS, but are as far as possible already integrated into the BOS planning.

Top priority
Satellite house-keeping has top priority and superseed all the above.