JAXA Plan for follow-on mission

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ALOS and its pictures

Jan. 30 2008

PALSAR Antenna backside

Antenna for Inter satellite communication

Solar paddle

Earth
Acquisition Term

1992/11/9
~2007/6/25

JERS-1
• 1992/11/9
• 1992/11/10
• 1996/5/8
• 1996/5/9

ALOS
• 2006/8/12
• 2007/6/25

Lat : S 2° 34’
Lon : W 54° 45’
Disaster Monitoring System

Disaster Monitoring Satellites

Data Relay Satellite

Ground System

Disaster Management Information Network of Japan

Ministries

Local administration

Products

Hazard Map

Volcanoes

Earthquake

Landslide

Flood

Fixed camera

Aircraft

Helicopter

Earthquake, Volcano, Flood, Landslide, Tsunami, Oil spill, Heavy snow, etc.
Core System (2 SAR + 2 OPT)

• **Satellite**
  - SAR satellite
    - GSD: 3m (strip map), 3m*1m (spotlight)
    - Swath: 50km
    - L-band
  - Optical satellite
    - GSD: 1m (Pan), 4m (Multi-spectral)
    - Swath: 50km
  - First satellite: launch target JFY2012

• **Ground System**
  - Quick response
    - Quick tasking (less than 1 hour)
    - Quick data processing and analysis (less than 1 hour for standard proc.)
  - Compatible with the existing information systems of Japanese governmental users
Solomon Earthquake

M8.1
April 2 2007

Three DinSAR
344:4/10-2/23
345:5/3-1/31
343:5/10-2/12

FBS343HH

No orbit tuned.
No further corrected.
Three paths overlaid.
Land slide of Chuetsu Earthquake 2004

2.5m分解能
1500m

切り出し位置

長岡市

2004年10月26日
観測Pi-SAR(L)

小千谷市

5m分解能

10m分解能

長岡市

切り出し位置

土砂崩れ現場（円内）

集落

土砂崩れ

国道589号線
Requirements to the SAR missions

• Change detections
• InSAR - Orbital maintenance (500m tube and frequent inclination maintenance)
  - coherence amplitude / phase change
• Polarizations

• First Target
  Deformation, flooding, volcano, land slide, subsiding, forest fire, etc.
  -> High resolution, good NESZ -> High quality SAR

• Second target
  Forest and wetland
  -> PALSAR performance + adding HV -> Mid-quality but wide swath SAR
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>L band</td>
</tr>
<tr>
<td>BW</td>
<td>&lt;85MHz, 42MHz, 28 MHz</td>
</tr>
<tr>
<td>Modes</td>
<td>Spot light, Strip, SCANSAR</td>
</tr>
<tr>
<td>Pr</td>
<td>&lt;6Kw</td>
</tr>
<tr>
<td>Swath</td>
<td>50 km ~ 70 km, 300km(SCAN)</td>
</tr>
<tr>
<td>Pol.</td>
<td>HH, HH+HV, HH+HV+VH+VV</td>
</tr>
<tr>
<td>Resolution</td>
<td>1m, 3m, ~PALSAR(5m), 1 look</td>
</tr>
<tr>
<td>Data rate</td>
<td>&lt; 800 Mbps</td>
</tr>
<tr>
<td>Orbit revisit</td>
<td>14 days, 628 km (14+3/14)</td>
</tr>
<tr>
<td>Bit</td>
<td>4 bit I&amp;Q, 2 bit I&amp;Q(BASQ)</td>
</tr>
<tr>
<td>Incidence</td>
<td>7 deg. ~ 70 deg. (30 ~ 45 deg. for forest)</td>
</tr>
<tr>
<td>DRTS</td>
<td>TBD (under discussion)</td>
</tr>
<tr>
<td>NESZ</td>
<td>&lt;-28 dB (20~40 degrees)</td>
</tr>
<tr>
<td>Amb (Rg, Az)</td>
<td>&gt;23 dB</td>
</tr>
<tr>
<td>Dual beams</td>
<td>Yes (1, 3 meter size)</td>
</tr>
<tr>
<td>Look dir.</td>
<td>Right and Left</td>
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</table>
Amazon mapping in ascending (each swath 30~45 deg.)
Conclusions

1) Forest monitoring using the PALSAR is ongoing. PALSAR is in good condition. More than 10 years life (fuel) expected.

2) ALOS follow-on satellite system is under designing. Missions:
   +) Disaster mitigation (flooding, deformation, earthquake, volcanoes,)
   +) Forest and wetland monitoring

3) L-band SARs (JERS-1, PALSAR, ALOS follow-on) will contribute the change detection for the forest.
   JERS-1: 568 km, 44 days
   ALOS: 691.5 km height: 46 days revisit
   ALOS follow-on: 628 km height, 14 days revisit
Harmonization of the disaster and the forest

Orbital parameters
Incidence angle variation: PALSAR similar mode
500km, 12 days, 4 beams/orbit -> 25 ~ 42 degrees

800km, 12 days, 4 beams/orbit -> 27(?) ~ 40 (?)
Losing the NESZ

Future task
To include the forest and wetland as the mission objectives
SAR parameterization harmonization with the Forest monitoring (being finished).