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Canadian Space Agency

Polar Space Task group
Oct 16 to 18, 2018
**RADARSAT Evolution**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td># of satellite</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Mass</td>
<td>2750 kg</td>
<td>2300 kg</td>
<td>1430 kg</td>
</tr>
<tr>
<td>Exact revisit</td>
<td>24 day</td>
<td>24 day</td>
<td>4 day (12 / sat)</td>
</tr>
<tr>
<td>SAR time / orbit</td>
<td>28 min</td>
<td>28 min</td>
<td>15 min / sat</td>
</tr>
<tr>
<td>Antenna size</td>
<td>15 m</td>
<td>15 m</td>
<td>6.75 m</td>
</tr>
<tr>
<td>Polarization</td>
<td>HH</td>
<td>HH, VV, HV, VH</td>
<td>HH, VV, HV, VH, Compact Pol.</td>
</tr>
<tr>
<td>Look direction</td>
<td>Right</td>
<td>Right or Left</td>
<td>Right</td>
</tr>
<tr>
<td>Altitude</td>
<td>800 km</td>
<td>800 km</td>
<td>600 km</td>
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RADARSAT Constellation Mission

- RCM is the evolution of the RADARSAT program with the objectives to:
  - Ensure data continuity and improve system reliability
  - Respond to the increasing needs of the Government of Canada for SAR data to support operations and the timely delivery of products and services to Canadians

- RCM is a government-owned mission, tailored to respond to the Canadian Government needs in 3 main areas:
  - Maritime surveillance
  - Disaster management
  - Ecosystem monitoring
THE MAKING OF A SATELLITE

THE RADARSAT-2 CONSTELLATION

http://www.asc-csa.gc.ca/eng/search/video/watch.asp?v=1_q83nzea1
RCM Improvements over previous RADARSAT missions

- Average daily revisit of any point over Canada
- Capability to potentially access any point on the Earth (except around the South Pole)
- 4-day exact repeat (as opposed to 24 days with RADARSAT-1 and 2) for Coherent Change Detection
- Circular Compact Polarization for better detection, measurement, and discrimination of surface features and characteristics.
- Secondary payload on board - Automatic Identification System (AIS) for ship detection and identification
Canadian Receiving Stations
Projected Timelines

Progressing Towards RCM Launch and Operations!

- **Q1 2018**: Completion of Ground Segment
- **Q3 2018**: Bus and Payload Assembly, Integration and Test
- **Q4 2018**: Commissioning (up to 3 months)
- **Launch**
- **Operations**
- **Q3 2018**: RCM Routine Data Collection
Project Status

• Assembly, integration and test (AIT) campaign of RCM spacecraft completed:
  ✓ The first, second and third spacecraft are in storage at MDA facilities (SSL) in Palo Alto, California until the start of launch site activities;

• Subsystems of ground segment were delivered and integrated into Primary Control Facility at CSA HQ (Longueuil, Qc) and the back-up facility in Ottawa.
CSA Data Contribution

- Ice Sheet – to be reported by Bernd Scheuchl
- Floating Ice - to be reported by Stephen Howell
- Snow:
  - Melting snow - to be reported by David Small
  - Terrestrial Snow Mass Mission (Phase 0) – To be reported by Chris Derksen
  - Snow RADAR Science Meeting - to be reported by Chris Derksen
  - Permafrost – All ABoVE sites acquired every cycles from May to October in Fine Quad mode for 2017 and 2018
Snow RADAR Science Meeting

- WMO HQ, Geneva, January 30-31, 2018
- Address priority science, technical, operational challenges of new spaceborne radar snow missions
- Focus on mission-relevant recommendations from the science community
- Review gaps regarding observing system capabilities and key snow products (SWE/SE)
- Address priority questions / products
- Dr. Chris Derksen to report on the outcomes and planning
Inter-Agency Programmatic and Collaboration

• Status: Inter-agency partnerships on snow and radar mission development are presently informal.

• Recommendation: Use existing programs and coordination frameworks (distributed globally) to ensure coherent and cohesive advancement of scientific and technological challenges related to the monitoring of snow cover - building on existing technology development and scientific advancement programs.

• Actions: Regional and thematically focused coordination activities are currently ongoing under the authority of several space agencies. Some of those coordination activities are project and instrument/mission focused and time constrained. In order to ensure coordination continuity among the snow science community and to facilitate the dialogue with a broad set of space agencies, **the creation of an ad hoc snow remote sensing science working group under the auspices of the Polar Space Task Group is recommended.** This new working group would build-on the regional working groups currently supported, ensure alignment to the overarching GCW coordination objectives towards the consolidation of a global monitoring network for snow, and finally provide a neutral forum to address key science and technology related priorities to be presented to CEOS and CGMS agencies.