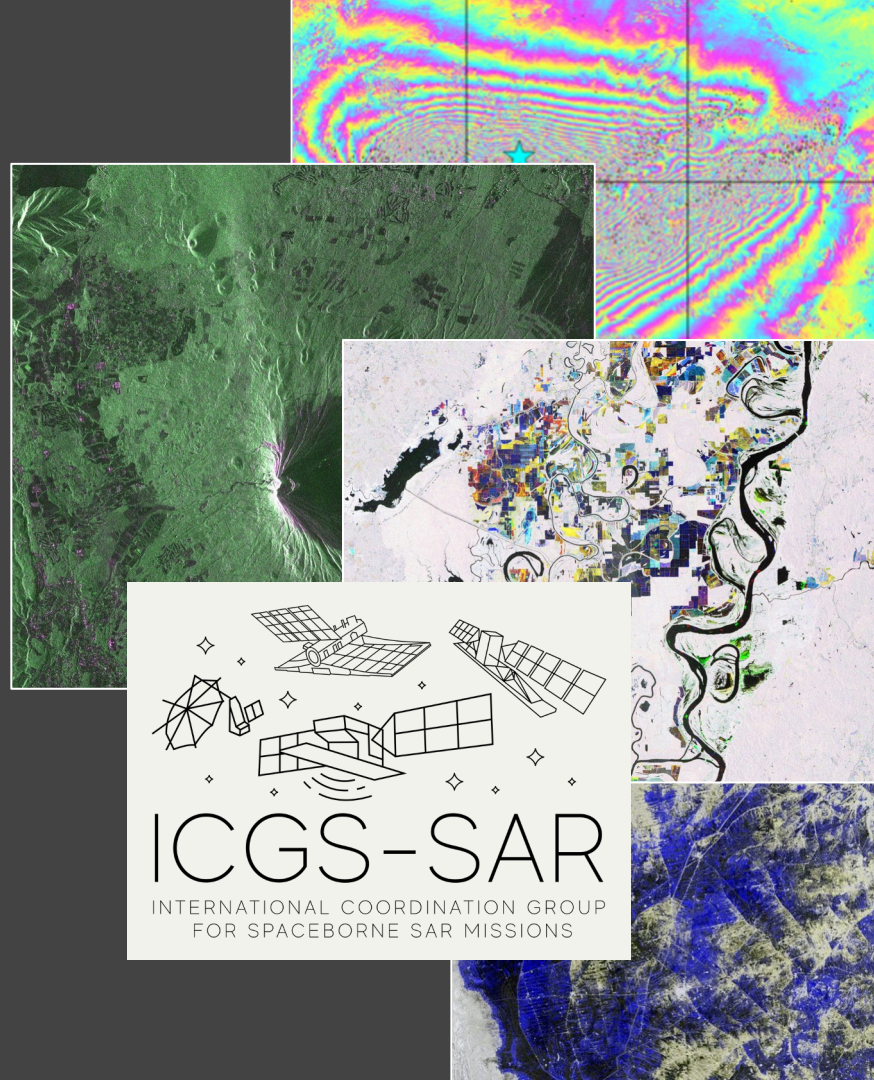
PRESENT AND FUTURE DATA VISIBILITY AND ACCESS OF INTERNATIONAL VIRTUAL SAR CONSTELLATION

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Agenda item 2.1

3rd International SAR Workshop
Saga Prefecture, Japan
6-8 November, 2024



Background of International SAR WS

ICGS-SAR
INTERNATIONAL COORDINATION GROUP FOR SPACEBORNE SAR MISSIONS

- On May 30, 31 and June 1, 2018, a workshop on International Spaceborne SAR Missions Coordination and Collaboration was held at the California Institute of Technology
  - To explore the interest, advantage and the significance of a more coordinated approach between the different organizations to achieve higher value to the user community.
  - To improve data visibility and accessibility of spaceborne SAR under the international coordination.
- Working Group 1 (WG-1) was established to understand the issues related to data discovery and data access, as well as to discuss and coordinate this topic with good examples.

Accomplishment of WG-1

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- Compiled information about number of satellite systems into two tables-> Need to update?
  - Table 1 illustrates discovery and accessibility of archived data
  - Table 2 summarized the discovery, tasking, and access to present and future data.

- Found that all agencies flying spaceborne SAR systems either provide all the data free of cost, or subsets of them for specific purpose or by entering into inter agency agreements. However, if all the data has standard geometric and radiometric formats, their value will be significantly enhanced.

Archive, Present and Future Data

Archive	ERS	ENV	ALOS-1	R1	JERS	SEASAT
F&O	Y	Y	Y	N/Y by ASF	Y	Y
Proposal						

Present and Future data	CSK	TSX	R2	S1	ALOS-2/4	RCM	NISAR	SAOCOM	RISAT
Discover present data	Yes	Y	Y	Y	Y	Y	Y	Y	Y
Discover furture data	No	No	No	Y	Y	Y	Y	?	-
Task	$(commercial)	$ and Propsal (science)	$ and P	Ad hoc (e.g. disaster)	Ad hoc, $ and P	Ad hoc	Ad hoc	P	$ and P
F&O	N	N	N	Y	N/Y for Scan in future	Y?	Y	N	N
Science Proposal	Y	Y	Y for Canada	-	Y	-	-	Y	Y
$ (Commercial)	Y	Y	Y	-	Y	-	-	Y	Y

WG-1's recommendation for further works at 1st workshop

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1. Data Discovery Recommendations
   - Need to increase the visibility of the diverse data discovery web sites.

2. Data Access Recommendations
   - Work towards free and open access to archival data subject to license and other restrictions (e.g. low spatial resolution).

3. Coordination and Tasking Recommendations
   - Need to coordinate data acquisitions for change detection (globally).
   - Encourage space agencies to coordinate missions to achieve long time series

4. Analysis Ready Data Recommendation
   - Work toward simplified and common ARD standards.

5. Data Distribution Efficiencies and Robustness Recommendations
   - The international InSAR community should agree to make mirrors of InSAR archives to improve data utilization.

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Future Discussion topics from 2nd WS

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1) Need active participation of WG 1 from participating organizations (ASI, CSA, CONAE, DLR, ESA, ISRO, JAXA, NASA with new space?)

2) Request to provide information and compile survey results of three main target area (virtual observation constellation, tasking and data sharing)
- Not limited governmental cooperation but also invite commercial small SAR satellite constellation – what is observation target and value?
- Include survey of SAR + OPTICS constellation? (e.g. S1+S2?) – what is observation target and value?
- request information from CEOS WGISS, GEO/CEOS ODC community and OGC to improve data and information access?

3) Discuss and coordinate way forward to enhance the current cooperative framework for virtual observation constellation, tasking and data sharing.
a) Virtual constellation
- Need to establish a scheme to have multi-agencies / organization virtual constellations? (A-Train type framework, GPM or ACCP?) for what?

b) Tasking and observation planning
- Do we need enhance emergency observation tasking beyond international disaster charter or sentinel Asia (what is a value / advantage of SAR emergency observation? Night / bad weather? And other reason?
- Mechanism of observation plan sharing (just KML?)

c) data sharing
- How to enhance / improve data and information sharing and for what? Need to have a pilot / demonstration projects (- cooperation with CEOS and/or GEO to specific theme?) to provide valuable outcome (e.g. Carbon STK – Biomass, sea ice monitoring, etc.)
- Data format standardization with CEOS WGISS or WGCV?

Need to survey of success story and beyond of international cooperation

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1) Virtual Observation Constellation (purpose / scope, observation target, framework)
    a) Current
        - Sentinel-1 + RCM
        - ALOS-2 + RCM (Sea Ice, Ship, …)
        - ALOS-2 + Sentinel-1 (Sea Ice, Ship, oil spill, …)
        - ALOS-2 + CSK/CSG (high temporal observation for disaster)
        - SAOCOM + CSK/CSG
        - Sentinel-1 + ICEYE
        - MOSAiC project campaign (TDX, S1, R2, A2 …) – sea ice
    b) Planning
        - ALOS-2 + ALOS-4
        - ALOS-2 + STRIX (SYNSPECTIVE) or QPS (IQPS) satellite
        - Sentinel-1 + NISAR + ALOS-4

Need to survey of success story and beyond of international cooperation

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2) Emergency observation tasking and observation plan coordination
    - Tasking mechanism
    - International disaster charter (manual coordination?)
        - Sentinel Asia (OPETIMS system)
        - Sea Winds Observation
    - Observation plan process / procedure and observation plan provision scheme

Agenda for discussion in WG1 in Ureshino, Saga

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(1) Tasking & Data Sharing Reports
- Have a discussion of lessons learned and experiences from the point of view of mission ordering and planning, and data distribution and products. This could be valuable for future missions development.
  - Sentinel-1 + RCM (Nuno Miranda)
  - RCM + S1, ALOS-2 (Stéphane Chalifoux)
  - CSK/CSG + A2, SAOCOM (Luigi Dini)
  - ALOS-2 + S1, RCM, CSK/CSG (Shin-ichi Sobue)

(2) Ideas and requests for the virtual constellation

1) Commercial partner requests and contributions:
  - Smart tasking for Disaster in Japan (SDS),
  - Interaction with Synspecitve, iQPS, etc. Synspective, QPS, ICEYE, MDA, etc.

2) Core users' requirement comments:
- Have an open discussion on how to strengthen collaboration between WG1: Current and future data and WG2: Future imaging systems.
  - GSI, JMA-MRI (online)
  - Iteration with TA1&2

