Overview of Two Decades of Coordinated Satellite SAR Data Acquisitions over Polar Regions

ERS-1/2 (1991-2011)

Envisat ASAR (2002-2012)

RADARSAT-1 (1995-2013)

PALSAR-2 (2014 - present) COSMO-SkyMed (2007 - present)

RADARSAT-2 (2007 - present)

→ Sentinel-1A (2014 - present)

COOPERATION and COORDINATION

Over the past two decades, the collection of large amounts of satellite radar imagery over vast polar regions has become an outstanding example of international cooperation among space agencies and the polar science community. Building on the successful cooperation and coordination during the International Polar Year, the Polar Space Task Group (PSTG) has recently re-enacted the SAR Coordination Working Group. This Group provides coordination among space agencies operating SAR satellites to facilitate acquisition and distribution of fundamental SAR datasets. It also contributes to the development of data products in support of cryospheric scientific research and applications.

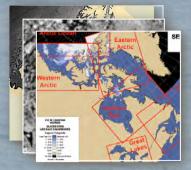
ALOS PALSAR-1 (2006-2011)

TerraSAR-X (2007 - present)

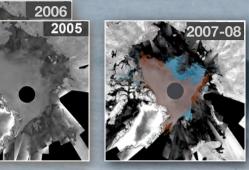
TanDEM-X (2008 - present)



ADARSAT-1 arctic Ocean, ASAP Project CSA, NASA,



RADARSAT-1 Cdn. Ice Centre archive data (CSA, EC/CIS, 1996-2013)





Thematic **SAR** data collection for selected regions



ERS-1 SAR Greenland mosaic and DEM [Ref. 1] (ESA, NSIDC 1993









TanDEM-X Greenland InSAR map (DLR 2011-13)

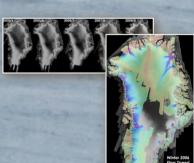
Greenland InSAR, dB map (CSA, **2013**)

RADARSAT-2 Greenland ice velocity, InSAR (CSA. 2014)

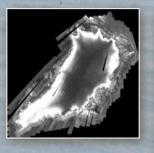
TerraSAR-X Greenland Greenland outlet glaciers (DLR. 2014-15 (ASI. 2014-

COSMO-SkyMed Sentinel-1 Greenland ice outlet glaciers

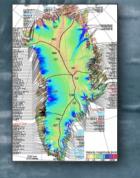


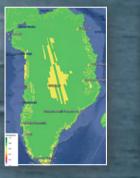




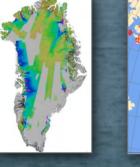


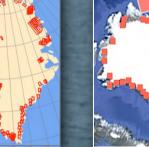


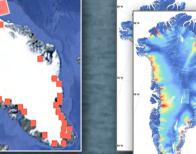










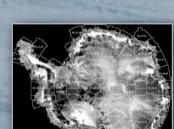


2004

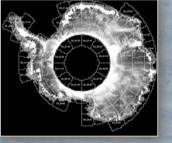
2009

2010

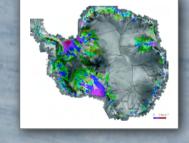
Polar Space Task Group - SAR Coordination Working Group >>>



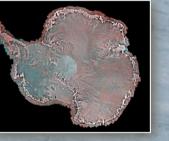
RADARSAT-1, AMM **Antarctic Mapping** Mission-1 (CSA, **1997**)



RADARSAT-1, MAMM Antarctic Mapping Mission 2 (CSA, 2000)



Ice flow dynamics and sources, [Ref. 2]



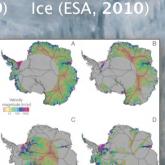
RADARSAT-2 dual-pol Antarctic Mapping Mission (CSA, MDA. 2007)



ALOS PALSAR Antarctica & Southern Ocean (IAXA 2008-09

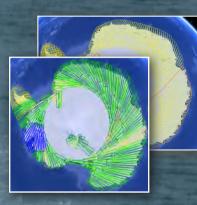


Envisat ASAR Southern Ocear

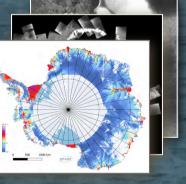




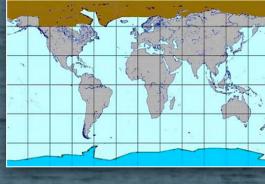
TerraSAR-X InSAR Mapping Antarctica glaciers (DLR, 2008-13



RADARSAT-2 Antarctica InSAR (CSA, MDA, 2013-14)



Sentinel-1A MyOcean SAR and Antarctica InSAR (ESA, 2015-16)



ALOS PALSAR-2 SAR Global mapping, incl. polar regions (JAXA)

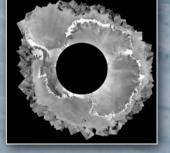
are common to several space agencies in support of their policy mandate, science priorities, and science community requirements. Coordinated activities can be highly beneficial. Over the next years, they will continue to provide multi-frequency observations over polar regions. These coordinated activities will ensure highfrequency of revisit in the case of coherent and interoperable datasets from various

missions, and they will strive for workload

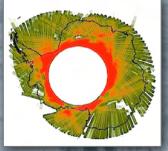
distribution across agencies - consistent

with mission constraints and capabilities.

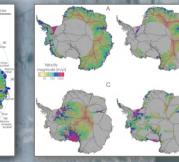
Polar imaging activities and polar interests



Envisat ASAR GMM Antarctica (ESA 2004)



Envisat ASAR . Polar Regions ESA **2007**)







COSMO-SkyMed Entire Antarctic coastal region and selected glaciers (ASI, 2014-)

REFERENCES:

[Ref. 1] Fahnestock et al. 1997

[Ref. 2] Rignot et al. 2006 [Ref. 3] Rignot et al. 2011

f. 4] Rignot & Mouginot 2012 f. 5] Nagler et al. 2015

NOTE:

This graphic was prepared on behalf of the Polar Space Task Group's SAR Coordination Working Group. The contributions and advice received from the working group members is gratefully acknowledged. The summary information presented here is not exhaustive. It reflects the status of plans and actual SAR data collections as of 2015.

For further information: http://www.wmo.int/pages/prog/sat/pstg-sarcwg_en.php

Concept & design: Dirk Werle (April 2016 update)













