DLR/TerraSAR-X: development of IPY portfolio
- status June 2009 -

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DLR/TerraSAR-X Activities after STG-4 meeting:

- publication in Environmental Geology, July 2009:
  \textbf{Antarctica During the IPY:}
  TerraSAR-X Images the Recovery Glacier System
  Dana Floriciou and Kenneth Jezek

- IGARSS'09:
  \textbf{TerraSAR-X Observations of the Recovery Glacier System, Antarctica}
  K. Jezek, D. Floriciou, K. Farness, N. Yague-Martinez, M. Eineder

- News on \url{http://www.dlr.de/terrasar-x}

- Acquisitions and processing of TerraSAR-X data from the IPY/GIIPSY - related TerraSAR-X science proposals:
  1. \textbf{High-Resolution Surface-Velocity Measurements of Antarctic Outlet Glaciers and Ice Streams (HYD0438)}
  2. \textbf{Ice velocity measurements of Greenland outlet glaciers (HYD0492)}
  3. \textbf{TerraSAR-X background mission “Antarctic Peninsula & Antarctic Ice Shelves“ initiative of Matthias Braun}
(1) Project HYD0438 - Antarctica

Left looking (not nominal) TerraSAR-X acquisitions over Antarctic ice sheet, south of 80°S: Tributary ice stream of Recovery glacier

courtesy K. Jezek

TerraSAR-X planned coverage (by Katy Farness)

Background: Radarsat-1 (RAMP) mosaic
Recovery Glacier tributary ice stream

- TerraSAR-X acquisitions started on 30.10.2008, ended on 26.01.2009
- Mode: stripmap, <3m resolution
- 3 complete coverages; total left looking acquisition time: 483"
Preliminary results on Recovery Glacier

Slow motion, below 1m/day. Combined methods InSAR and feature tracking

TSX Backscattering 11 days Interferogram Velocity map (feature tracking)
Surface velocity of RAMP tributary derived by speckle tracking

21 pairs of stripmap TSX scenes
1 pair ~ 10GB

Quota of TSX proposal HYD0438:
200 products
~70 TSX products delivered
(2) Project HYD0492 - Greenland

- 245 TerraSAR-X products approved
- Repeat pass pairs are collected several times per year over about 20 rapidly changing outlet glaciers. Planning by Ian Joughin (Univ. of Washington)
- TerraSAR-X acquisitions started end of January 2009
- Planned: about 5 TSX pairs per glacier per year. More for Jakobshavn, Kangerlussuaq and Helheim.
- Status June 2009: first two mappings done – no failed data takes, 92 products delivered.
TerraSAR-X acquired data Greenland, status June 2009

Kangerlussuaq: 3 pairs

Helheim: 2 pairs, 3rd ongoing

Jakobshavn: 7 pairs
(3) TerraSAR-X background mission "Antarctic Peninsula & Antarctic Ice Shelves"

- East Antarctic Ice Shelves:
  - 144 items stripmap mode

- Antarctic Peninsula:
  - 122 items stripmap mode

- Pine Island Bay:
  - 58 items stripmap mode

- Wilkins Ice Shelf:
  - 52 items scan SAR mode
  - 88 items stripmap mode
  - In science project LAN_0013
Wilkins Ice shelf collapse April 2009
Ongoing and future activities at DLR:

1. Update TerraSAR-X Digital Elevation Model (DEM) database
   The replacement of the GLOBE DEM used to process TerraSAR-X data over Antarctica with the most accurate DEM based on IceSat and ERS-1 altimeter data recently derived by J. Bamber et al (2008) is ongoing.

2. Participation at IGARSS09


5. Acquisitions over Greenland will continue through December 2009

6. Ice velocity maps generation from TSX left looking data
Planning of left looking acquisitions in the pole hole over Transantarctic Mts – ongoing -> scheduled August - October 2009