CryoLand Snow and Land Ice Prototype Products from Sentinel Data

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The Sentinels Snow and Land Ice Prototype Products from Sentinel Data

- The Sentinels
 - Sentinel-1
 - SAR (sun, weather independent)
 - 12 day repeat pass
 - Sentinel-2
 - Heritage mission of Spot/Landsat
 - Sentinel-3
 - SLSTR (follow on of AATSR)
 - OLCI (follow on of MERIS)
 - Daily Global Coverage











- Polar orbiting
- 12 day repeat
- Paths overlap in Central Europe
- Soon in
 Constellation



- Sentinel-1 Products of Cryoland
 - Wet Snow Map
 - Glacier Velocity
 - Glacier Lake Outlines

Wet snow Norway Nov 13, 2014 5:47 UTC Snow and Land Ice Prototype Products from Sentinel Data



Comparison with hydrological model





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Wet Snow Switzerland Nov 15 2014 Snow and Land Ice Prototype Products from Sentinel Data

SAR_Backsatter_S1A_IW_20141115_053443





Wet snow (red) superimposed on SAR radar backscatter.

Wet snow (red) superimposed on the MODIS snow cover fraction for an area in Switzerland. (Processing Norut).

Melting Snow on Glaciers, Svalbard Snow and Land Ice Prototype Products from Sentinel Data

We use a reference image from Oct 16, 2014 during cold conditions.

Sentinel-1 EW mode applied (HH/HV polarizations)



15 March 2011 Product Portfolio

Legend

Product: Composite image showing wet snow (SAR), and some land cover types. SAR radar backscatter forms the background.

Sensor: Sentinel-1A EW Date: Oct 4, 2014, 06.15 UTC Ref image: Oct 16, 2014 06:15 Image resolution: 50 m



Glacier Velocity, Western Greenland Snow and Land Ice Prototype Products from Sentinel Data



Gray: Sentinel-1 Background:Joughin et al. (2010)



Sentinel-1 Glacier Velocity map of the Upernvaik area







Preliminary Ice Velocity maps derived from Sentinel-1 IWS SLC data. Observation time is 12 days. Right: displacement in range, Left: displacement in azimuth.









Tsho Rolpa glacier lake

Lake outlines Sentinel-1 October 2014 (red) and from Terrasar-X April 2009 (green), October 2009 (magenta), May 2010 (green) as reference

Lumding Tsho glacier lake

Lake outlines from Sentinel-1 October 2014 (red) and Terrasar-X April 2009 (green), October 2009 (magenta), May 2010 (green) as reference

- Sentinel-1 operational since early October 2014
- Data access is free
- 12 days repeat orbit, 6 days with Sentinel-1b to be launched soon
- Overlapping orbits allow coverage in Central Europe about 5 days (2 days)
- First Products released
- Services for wet snow mapping, glacier velocity and glacier lake mapping successfully implemented at NORUT, ENVEO and GAMMA

