Snow Cover Monitoring using Multi-temporal ENVISAT ASAR Data

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SNOW COVER MONITORING USING MULTI-TEMPORAL ENVISAT/ASAR DATA

Processing Chain:

ASAR IMS Product

\[ \text{SLC } DN = \sqrt{(I^2 + Q^2)} \]

Abs. Calibration
Detection + Multilooking [dB]

\[ \gamma^\circ_{i,j} = \frac{D N^2_{i,j}}{K} \frac{1}{G(\theta_{i,j})^2} \left[ \frac{R_{i,j}}{R_{\text{ref}}} \right]^3 / A_i \]

Geocoding

Geocode / Radiometrically
Terrain Corrected (GTC/RTC)

Reference image

Difference

\[ \Delta \text{ dB} \]
RGB Overlay
Late summer 2006

Difference Method

Method: \( \Delta \gamma = \gamma_{\text{img}} / \gamma_{\text{ref}} \) or

\[ \Delta \gamma (dB) = 10 \times \log_{10}(\gamma_{\text{img}}) - 10 \times \log_{10}(\gamma_{\text{ref}}) \]

Quantitative Results: wet snow cover maps

February 2006  April 2006

June 2006  September 2006

Wet snow vs. dry snow

06.09.2006  11.10.2006  15.11.2006
Quantitative Results: 2D-histograms

February 2006

April 2006

June 2006

September 2006

October 2006

Seasonal trend graph:
Improved Retrieval of Thematic Snow Information with Geometric and Radiometric Corrections

Geocoded Terrain Corrected (GTC)  Radiometrically Terrain Corrected (RTC)

ASAR WSM VV Products

05.08.2006  03.04.2006  23.01.2006

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