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DETERMINATION OF GLACIER SURFACE AREA USING SPACEBORNE SAR IMAGERY

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Abstract. Glaciers are very important climate indicators. Although visible remote sensing techniques can be used to extract glacier variations effectively and accurately, the necessary data are depending on good weather conditions. In this paper, a method for determination of glacier surface area using multi-temporal and multi-angle high resolution TerraSAR-X data sets is presented. We reduce the "data holes" in the SAR scenes affected by radar shadowing and specular backscattering of smooth ice surfaces by combining the two complementary different imaging geometries (from ascending and descending satellite tracks). Then, a set of suitable features is derived from the intensity image, the texture information generated based on the gray level co-occurrence matrix (GLCM), glacier velocity estimated by speckle tracking, and the interferometric coherence map. Furthermore, the features are selected by 10-fold cross-validation based on the feature relevance importance on classification accuracy using a Random Forests (RF) classifier. With these most relevant features, the glacier surface is discriminated from the background by RF classification in order to calculate the corresponding surface area.

[Conference Paper](#) (PDF, 742 KB)

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