# PRELIMINARY TERRASAR-X OBSERVATIONS FOR TEMPERATE GLACIERS ON THE CHAMONIX MONT BLANC TEST SITE

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The new TerraSar-X sensor provides an excellent resolution which has never been reached yet by a satellite. Glaciers are a quite important part of climate evolution studies and they are good indicators for climate changes. Many studies have shown that SAR imaging could be a powerfull tool to observe their temporal evolution [1] but some of these tools are limited by the resolution of previous sensors and by the high temporal evolution of the temperate glaciers surfaces. In such latitudes, the glaciers surfaces change very quickly and that makes some coherency loss when comparing two SAR signals at two different dates. Moreover, the methods based on correlation are not very accurate to measure glaciers velocity because of the quite homogeneity of glaciers surfaces comparing to the high speckle noise.

The increase of the resolution provided by the TerraSAR-X sensor makes the texture of glaciers more detailed. Indeed crevasses and erratic rocks are now quite visible with fine quality. This paper presents some preliminary observations of temperate glaciers using those new data. Some interferograms have been generated on the Chamonix Mont Blanc test site and a classical correlation method has been computed with these new high resolution SAR images. On the one hand, the coherence seems to still be bad on glaciers surfaces since a better resolution doesn't decrease the speckle noise. On the other hand, many details appear in the new TerraSAR-X images which make correlation methods more accurate.

The correlation coefficient used for this study is derived from the classical one [2]. It takes into account the multiplicative aspect of the speckle noise. An other technique based on optical flux is currently tested on speckle filtered images. As the resolution increase more and more, surface textures become more and more detailed so optical techniques for motion and changes estimation could work on SAR images. Each method is tested on the Argentiere glacier where TerraSAR-X acquisitions are planned in stripmap mode every eleven days.

These first observations are indeed encouraging for future PolInSAR methods development.

## 1. REFERENCES

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