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SMART FILTERING OF INTERFEROMETRIC PHASES FOR ENHANCING BUILDING RECONSTRUCTION

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Abstract. The current generation of space borne high resolution SAR sensors provides high spatial resolution as well as interferometric data within short time frames. This makes such data attractive for 3D information extraction. Especially, the operational configuration of TerraSAR-X and TanDEM-X opens up new perspectives for this kind of applications. Despite of this, the interferometric phases still suffer from considerable noise, so that filtering is mandatory to enhance building reconstruction.

In our previous work, we used conventional Multilook-filtering to smooth the phase signature. For large buildings acceptable filter results are shown, but signatures of small buildings and significant layover areas are destroyed by the use of large square windows. Such filters are especially inappropriate if building orientations are not aligned with the sensor flight direction. Hence, in this paper, we present modified InSAR phase filters to support 3D building reconstruction. The implementation focuses on two different strategies: on the one hand taking GIS information into account, in order to parameterize the filters accordingly, and on the other hand purely relying on the image data. The filters are tested on simulated interferometric phases and on real single-pass airborne InSAR data. Finally, filter properties are compared with current standard InSAR filters.

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