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Reduction of InSAR Noise using Spherical Smoothing Splines

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The phase of interferometric SAR is generally affected by decorrelation due to different type of noises such as thermal noise, temporal change and geometric differences. Phase measurements on interferograms must be unwrapped to extract applicable Information. Denoising the interferometric phase is very important to improve the accuracy of measurements and facilitate the phase unwrapping stage.
Spherical splines can efficiently lower the noise, if the bandwith and smoothing parameters are chosen correctly. The spherical smoothing spline parameters, namely bandwidth and smoothing parameters, are chosen based on Generalized Cross Validation (GCV) function and signal to noise ratio (SNR).
In this paper a new method is presented to reduce the phase noise, over interferograms generated from Envisat images, based on Spherical Splines. Statistical tests and numerical validation of results are used to prove the efficiency of this approach.