Efficient Strategy selection of permanent and distributed Scatterers In non-urban areas

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The detection of ground motion using differential interferometry SAR (Synthetic Aperture Radar) has given excellent results in many application domains.
Since the early 2000s, a new dimension has been given to this technique with a dual purpose of being able to use all available data and try to overcome the most of these limitations (décorélations). Among the proposed approaches, we include the PSI (permanent scatterers interferometry) approach. This approach aims to identify pixels with a single dominant response in the cell resolution PS (Permanent Scatterer), these pixels are less affected by the correlation and allow us to use interferometric associated phases to infer the time series of the deformation. The PSI concept has been successfully applied in urban applications because of the high density of these targets, but its effectiveness is defective in non-urban areas (scarcity of PS (s)). To this end, the same initiators of this concept have proposed an alternative approach to strengthen the process of PSI in non-urban areas. This approach aims to locate and construct sets of target areas with similar statistical properties, called DS (Distributed scatterers). Note that DS (s) are homogeneous areas favorable to the development of speckle noise. To this end, and once selected, the DS (s) require a matched filter. PS(s) are not concerned by this filtering because they are very coherent point targets.
In this context, the paper that we propose focuses on a selection strategy of PS (s) and DS (s) based on the separation of selections. As a first step, we will select PS (s) using the coherence maps or amplitude images. In a second step, we proceed to the selection and optimization of the DS (s). This last step concerns the selection, filtering, optimization and phase triangulation to keep finally the best targets from each DS. The targets selected from each DS will join the PS (s) to form a denser sparse grid. This grid forms the basis in estimating of different contributions of the phase in PSInSAR process.