SAR image refocusing on specific grids for interferometric processing

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SAR interferometry requires pixel-to-pixel match between same scatterers in SAR image pairs. Thus coregistration, the alignments of SAR images from two different acquisitions, is an essential step for the accurate determination of phase difference. SAR images are acquired from about 700 km slant range distance with baselines smaller than a few hundred meters, so there is no visible parallax, but the purpose of the coregistration is to align the samples for phase differencing. However, for the computation of displacements regarding a certain extended target (like an infrastructure element, e.g.: a dam) whose position is precisely known the interferogram can be obtained after refocusing the image pairs on a specific grid. In this way the displacements of highly reflective scatterers with known positions can be accurately measured. In comparison with the coregistration based inteferogram, with this approach, a known scatterer can't have an inconvenient position for processing in the SAR image (e.g.: to be at the edge of 4 neighboring pixels) because one pixel can be at the measured coordinates of the desired target. The refocusing technique is investigated with a couple of images acquired by the TanDEM-X satellite over the "Puylaurent dam" between march-june 2012. In future work, the displacements obtained for the ridge of the dam relative to the dam border will be compared with the in situ values provided by the EDF company.