



Topographic phase correlation improvement of D-InSAR and ScanSAR: An application to South American earthquakes

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Both the Image Mode (IM) and the Wide Swath (WS) mode of the ASAR instrument aboard the Envisat satellite have the capability to image an along-track stripe of Earth's surface covering an area with a length of several hundreds kilometres. In addition, the WS interferograms cover an area with swath coverage of about 400 km, in contrast to the 100 km swath of the IM data. This enhances greatly our ability to map surface displacement caused by major events that tend to span 100s of kilometres. The results of WS and IM data may, however, be influenced significantly by a topographic phase contribution. We developed a topographic-phase-correlation algorithm to account for such effect in InSAR and ScanSAR interferograms. We apply our methodology to derive accurate displacement maps associated with two large subduction earthquakes: the November 14th, 2007 Tocopilla earthquake in Chile and the 2007 August 15th Pisco earthquake in Peru.