



## **High Resolution TerraSAR-X Data versus Medium Resolution L-Band Data for Crustal Deformation InSAR**

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The successful use of InSAR for crustal deformation relies on a number of conditions. The most important ones are phase coherence, phase accuracy, spatial resolution, short revisit rate, different observation geometries for motion vector determination and wide or even global coverage.

Current SAR missions cover only a subset of this feature space. In fact, the German very high resolution TerraSAR-X satellite was more designed for large scale mapping than for a global geodetic mission. Nevertheless, a number of experiments performed in the past two years reveal advantages and sometimes surprising details that are suitable for crustal deformation measurement:

- short 11 day revisit rate
- coherence better than previously predicted by models
- variable viewing geometry
- very high absolute and relative geometric accuracy

We report on a number of PSI based experiments with TerraSAR-X data and demonstrate the potential and the limits w.r.t. deformation measurements on man-made buildings and on natural sites.

For the future, DLR investigates jointly with NASA/JPL a mission dedicated to crustal deformation monitoring, namely the TanDEM-L/DESDynI mission. We present the mission concepts and justify the design with results from experiments performed with ALOS/PALSAR data.