SIMULATION ASSISTED HIGH-RESOLUTION PS-INSAR ANALYSIS

A. Schunert[*a] T. Balz[b] K. Liu[b] M. Liao[b] U. Sörgel[a] J. Wegner[a]

[a] Leibniz Universität Hannover, Institute of Photogrammetry and
GeoInformation, Nienburger Strasse 1, 30167, Hannover, Germany
[b] Wuhan University, State Key Laboratory of Information Engineering in Surveying,
Mapping and Remote Sensing, 129 Luoyu Road , 430079, Wuhan , China

Technical Commission VII Symposium 2010

KEY WORDS: SAR, Radar, PSI, Simulation, TerraSAR-X

ABSTRACT:

Since the first demonstration of the potential of the differential SAR interferometry in the early 1990s a lot of effort has been made to accurately estimate ground deformation with imaging radar sensors. PS-InSAR enables the estimation of ground deformation for a set of temporally stable radar reflectors, the so called PS, with millimetre accuracy. Only few research was conducted concerning the assignment of real world features to the found PS. With the dawn of the next generation space born SAR sensors like TerraSAR-X (TSX), which provide a resolution of up to one meter, even an assignment of PS to individual structures of a building becomes feasible. We use a TSX data stack and a 3D city model to match PS with real world building features. A set of PS is extracted from the stack of TSX images. Mapping of these PS to the city model can not be done unambiguously due to the poor resolution in elevation direction. These ambiguities are now solved by determining possible Persistent Scatterer (PS) positions by SAR simulation based on the 3D city model with emphasis on localisation of stable double-bounce and triple-bounce reflections. These simulated PS candidates are compared to the PS extracted from the SAR data.

TOPIC: Microwave remote sensing
ALTERNATIVE TOPIC: Remote sensing applications