

Multi-Temporal InSAR Analyses in China

*Perissin, Daniele*¹; *Wang, Zhiying*²; *Rocca, Fabio*³

¹POLIMI/CUHK, HONG KONG; ²POLIMI/HITSZ, CHINA; ³POLIMI, ITALY

In this work we will show the progress of the research carried out within the framework of the Dragon project by the "Topographic measurement" team, ID 5297. Since the beginning of the Dragon exchange program, our group is working on the development of InSAR processing techniques to retrieve geophysical parameters of the analyzed terrain in China. In particular, we focused the attention on two main directions.

The first one is about urban areas analysis. In this context, we processed a dataset of 35 Cosmo SkyMed images in Shanghai with the Permanent Scatterers technique. The area covers about 800 sq km and about 1.2 M PS's were detected. The result shows impressive details of the ground subsidence of the city. In the past 2-3 years Shanghai developed several new metro lines, and subway tunnels were excavated throughout the city. The PS analysis with Cosmo data clearly reveals the path of the tunnels through the terrain motion of the above surface. As a second urban area, we processed TerraSAR-X data in Hong Kong. Beside the interesting results of the ground motion (revealing the terrain settlement over reclaimed land), we developed new techniques to detect urban changes. Through high resolution SAR data it is in fact possible to identify new constructions and land changes, providing very useful tools for land use monitoring.

As a last urban example, we are processing L and X band data in Tianjin, where the deformation is particularly strong and far from linear. To the aim, data are being analyzed with new multi-temporal techniques, to better exploit partially coherent targets to retrieve non linear trends.

The second direction we pursued is the analysis of wide extra-urban areas to retrieve long-wavelength motions. The subject is in fact of fundamental importance for studying tectonic activities. To the aim we processed several frames of Envisat data at a time in the PRD region. The main issue to solve in this case is the orbital correction, which became mandatory after the maneuvers operated on the satellite. Results from the mentioned works will be shown together with a description of the adopted processing strategies.