



EXPERIMENTAL STUDIES ON MONITORING GROUND DEFORMATIONS WITH CORNER REFLECTOR INSAR

Xiaoli DING¹, Jiangping LONG¹, Rong XIANG¹, Zhiwei LI¹, Eric FUNG²,
Vitus CHAN², Qiang CHEN¹, Peter DAMOAH-AFARI¹, Guangcai FENG¹ and Zu ZHONG³

The Hong Kong Polytechnic University¹
Civil Engineering and Development Department, Government of HKSAR²
U.S. Geological Survey³

Abstract: Six corner reflectors (CR) installed on a hillside slope and on reclaimed land in Hong Kong are used as point targets in our interferometric synthetic aperture radar (InSAR) experiments to study ground motions related to the landslide and ground settlement. Eight ESA ENVISAT SAR images spanning from February 2006 to May 2007 are used in the study. The Least-square AMBiguity Decorrelation Adjustment method (LAMBDA) that was originally developed for phase ambiguity resolution in GPS positioning is used for phase unwrapping in processing the InSAR data. The zenith tropospheric delays determined with 12 continuous GPS stations in Hong Kong are used in the study to determine and correct for the tropospheric delays to the InSAR measurements. Both linear and periodic deformation models are tested in the study. The study demonstrates that the CRInSAR method provides accurate results in monitoring ground motions.

Key words: InSAR, corner reflector InSAR, ground motions

Corresponding author contacts

Xiaoli DING
lsxlding@polyu.edu.hk
The Hong Kong Polytechnic University
Hong Kong, China