Geophysical Research Abstracts, Vol. 7, 06009, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06009

A slow landslide in central Taiwan induced by Chi-Chi Earthquake revealed by PIV analysis

J.-C. Hu (1),C.-H. Tseng (1), Y.-C. Chan (2), J.-F. Lee (3) J.-Y. Wei (3)

(1) Department of Geosciences, National Taiwan University, Taipei, Taiwan, (2)Institute of Earth Sciences, Academia Sinica, Taipei, Taiwan, (3) Central Geological Survey, Taipei, Taiwan (jchu@ntu.edu.tw / Fax: +886-2-23636095)

The Chi-Chi Earthquake occurred in the western foothills of Central Taiwan, which triggered two fast and catastrophic Chiufengershan landslide and Tsaoling rockslides. After two days of Chi-Chi event, the slow Hongtsaiping slide (Central Taiwan) is reported with several meters of slide in an area of about 1.2 km^2 (800 m x 1500 m). Therefore, we want to know if non-failure or unobvious slides are the omens of landslides or rockslides in this area. We also try to characterize in detail the slide directions, their magnitudes and region of slides.

We use two gray aerial photos of the same selected area (Taiwan Grid 67, 1:5000, pixel size of 0.25 m) acquired from Central Geological Survey (CGS) and Chinese Society of Photogrammetry & Remote Sensing (CSPRS) which are taken in 1998 and 2002 through a software Particle Image Velocimetry (PIV) analysis. Trough PIV we can set reference points at will in order to let PIV correlate the pixels of two aerial photos so that it can tell us the displacement vector field due to the topographic change. Of course, PIV can only show displacement field instead of vectors, so we will differentiate regions of different amount of displacement. The results will be precise if we can remove the offsets between the two gray aerial photos and the amount of displacement is obviously large enough. Therefore, the results of PIV analysis will help us not only find the areas in which sliding has happened, but also evaluate the azimuth and magnitudes of sliding. We use PIV analysis in the Hongtsaiping area which covers a dimension of 3129 x 2538 pixels. Our results show that the maximum horizontal displacement is about 11 m towards NW in the slide area of about 1.2 km^2. This tremendous slow slide need to further investigation in combining with the

geological data.