Geophysical Research Abstracts,
Vol. 10, EGU2008-A-04903, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-04903
EGU General Assembly 2008

Current crustal deformation in active collision mountain belt revealed by continuous GPS measurements in Taiwan

J.-C. Hu (1), K.-C. Lin (2), K.-E. Ching (3), R.-J. Rau (3), T.-T. Yu (4) and T.-H. Tsai (2)

(1) Dept. of Geosciences, National Taiwan University, Taiwan (jchu@ntu.edu.tw), (2) Seismological Observation Center of the Central Weather Bureau, Taiwan, (3) Dept. of Earth Sciences, National Cheng Kung University, Taiwan, (4) Satellite Geoinformatics Research Center, National Cheng Kung University, Taiwan

We analyzed 110 continuous GPS (CGPS) data from 2003 to 2005 in Taiwan area to characterize crustal deformation after the Chi-Chi earthquake occurred on September 21, 1999. During this period, the Mw=6.8 Chengkung earthquake and Mw=5.9 Ilan earthquake occurred on December 10, 2003 and March 5, 2005 respectively in eastern Taiwan. We analyzed the velocity field of the GPS stations relative to Paisha station (S01R) of Panghu island, located in stable continental shelf in order to compare with the previous results of GPS measurements form 1990 to 1995. The changes in baseline lengths from the continuous GPS measurement are used to assess the spatial variation of the horizontal crustal strain over Taiwan area. From CGPS data, the maximum coseismic deformation during Chengkung earthquake reached 12.5 cm in horizontal and 15.4 cm in vertical, respectively. In eastern Taiwan, stations between Hualien (HUAL) to Lauyu (LANY) have average displacement of 34-92 mm/yr in the direction of 302.7˚-320.8˚. Significant postseismic deformation has been detected in the central Taiwan with large displacement about 29.4-45.8 mm/yr in the direction of 283.0˚-289.2˚ after the Chi-Chi earthquake. In general, the deformation pattern for CGPS stations consistent with the stress distribution due to the arc-continent collision process. The most prominent feature of the strain distribution patterns in the study area certainly corresponds to the significant compressional strain across the Longitu-

dinal Valley fault in eastern Taiwan, which represents the collisional boundary. The deformation front near the western Taiwan also show significant compressional strain rate. In contrast, the transition of subduction-collision region, such as the Ilan plain north and Pingtung plain in south both show the remarkable extensional strain. The extensional strain shows in the southern Central Range may correspond to quick uplift incipient collision process.