



Current Crustal Deformation and Strain Rate in Taiwan Deduced From Continuous GPS Measurements

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We analyzed 100 continuous GPS (CGPS) data from 2003 to 2005 in Taiwan area to detect crustal deformation after the Chi-Chi earthquake occurred on September 21, 1999. During this period, the $M_w=6.8$ Chengkung earthquake and $M_w=5.9$ Ilan earthquake occurred on December 10, 2003 and March 5, 2005 in eastern Taiwan. From CGPS data, the maximum coseismic deformation during Chengkung earthquake reached 12.5 cm in horizontal and 15.4 cm in vertical, respectively. According to CGPS data, we analyzed the deformation of the GPS stations relative to Kinmen (KMNM), located in continental shelf near Mainland China. In eastern Taiwan, stations between Hualien (HUAL) to Laayu (LANY) have average displacement of 34–92 mm/yr in the direction of 302.7°–320.8°. Significant deformation has been detected in the central Taiwan, and there is large displacement about 29.4–45.8 mm/yr in the direction of 283.0°–289.2° after Chi-Chi earthquake. In contrast, the Ilan plain and Pingtung plain are under extensional deformation of NW-SE and NE-SW respectively. 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 Longitudinal 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.