



Active crustal deformation of Tainan tableland, southwestern Taiwan based on SAR interferometry and other geodetic measurements

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The D-InSAR technique is applied to detect the active fault-related folding structure of the Tainan tableland near the deformation front in SW Taiwan, by using ERS SAR images from 1996 to 2000. The Tainan tableland is supposed to be located in-between a blind fault in the west and the Houchiali fault in the east, thus the Tainan tableland is interpreted as a pop-up structure in a fold-thrust belt at active tectonic margin. Interferometric processing SAR images in 35 days interval between 1996 and 2000 reveals the average slant range deformation (SRD) as ~ 12.5 mm/yr. The uplift rate is higher in eastern Tainan tableland than that in western, and this rate increases from west edge of Tainan tableland and decreases across the Houchiali fault. Furthermore 5 precise leveling surveys across Tainan tableland over a period of 2 years show an uplift rate of ~ 14 mm/yr for the benchmarks on the tableland. Based on the 2-D analytical solution with the constraint of the inferred fault geometry, the slip rate along the inferred Tainan fault is ~ 16 mm/yr, ~ 10 mm/yr along the Houchiali fault, and ~ 25 mm/yr along the inferred Chungchou fault. In addition, the combination of D-InSAR, GPS data and the precise leveling data reveals that the short-term deformation rate is larger than long-term deformation rate, which implies that a destructive seismic event could occur in the eastern Tainan area.