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Active tectonics of frontal thrust, southwestern Taiwan orogenic belt

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Thrust belts are characterized by great earthquakes, crustal shortening deformation, and extraordinary topographic relief and represent a fundamental manifestation of deformation in active orogenic belt. During the Quaternary period, Taiwan Orogen in arc-continent collisional convergent settings occurs as a result of the active thin-skin thrust belt which is displayed in the Western Foothills, western Taiwan. The Western Foothills represent a zone of ongoing convergence which shortening occurs in response to the thrusts westward movement. Recent geodetic studies indicate present shortening rates of ca. 40 mm/yr within the Western Foothills, southwestern Taiwan. It suggested high rates of deformation and is often considered to behave as a strong deformation within the southwestern Taiwan. In the study area is a ongoing deformation front which is dominated by a NE-SW trending structure fabric that consist of three active thrust faults. The geomorphic expression, which preserves a young surface features, is made up of five topographic and structural provinces of the Western Foothills, Chungchou Marine Terrace, Dawan Lowland, Tainan Tableland, and Chianan Coastal Plain from east to west which province due to the tectonic deformation were created during the late Pleistocene, that have been subsequently deformed by a major thrust of the Tainan fault and three imbricated faults of the Lungchuan, Meilin, and Chungchou faults. In this study we first use continuously cored boreholes to reconstruct the depositional architecture and 14C dating of the Holocene sediments, result of this analysis is able to assess the uplift rate and activity. The long-term vertical deformation rate of the Chianan Coastal Plain, Tainan Tableland, Dawan Lowland, Chungchou Marine Terrace, and Western Foothills was about -6 to 0, 0 to 5, -2 to 1, 1 to 4, and 6 to 7 mm/yr, respectively.