

# Present-day Rapid Deformation of Liuchiusu: The Southwestern-most of Taiwan Deformation Front

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LiuChiuSu is a 6-km-wide small island located offshore southwestern Taiwan, the outermost of Taiwan collision zone, where only limited geologic and geodetic studies have been conducted. As a result of a regional bathymetry survey conducted during the 1980s, the island's tectonics were first linked to submarine mud diapirs. Later, geological survey and dating data suggest rapid Holocene uplift, which was interpreted as a thrust and detachment related process. Recent studies provide an insight into detachment-folding. However, all previous research has been focused on vertical motion at the geological time scales, with little understanding of horizontal motion. Our study utilized Sentinel-1 TOPSAR images with the PS-InSAR technique to form a contemporary Line-Of-Sight velocity field of LiuChiuSu island, answering how the island's deformation is dominated by horizontal motion. We also examine how to fine-tune PS-InSAR parameters to obtain optimized PS distributions. Furthermore, we reveal an alternative perspective for the geological structure of LiuChiuSu and its role in southwestern Taiwan regional tectonics.

**Keywords:** InSAR, creep, active tectonics, interseismic deformation