

## **Tectonic activity and mud volcanism at Gunshuiping,** southwestern Taiwan

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## I. INTRODUCTION

- In southern Taiwan, mud volcanoes are common near the axis of faults and anticlines in the We consider two possible scenarios for the formation Coastal Plain and Western Foothills, where the geology is dominated by the 3-5-km-thick of mud volcanoes Gutingkeng mudstone formation, late Miocene to Pleistocene in age. Previous researchers reported the possibility of a southwest striking right-lateral strike-slip fault in the Holocene Coastal Plain based on InSAR and GPS data (Fig 1). The inferred fault trace is associated with a topographic scarp and with the presence of the Gunshuiping mud volcano (Yanchao, Kaohsiung) (Fig 2).
- This leads us to investigate the kinematics of the active fault during the Holocene and its relation with the formation of the mud volcano. Since that allows us to have a better understanding of mud volcanoes as an indicator of tectonic activity.







Mud migrating upwards through Mud migrating upwards through fractures fractures in relation to fault activity in relation to diapirism (modified from Deyhle A, et al., 2003) (modified from Hudec M. R, et al., 2021)





## **II. GEOLOGICAL SETTING**



Figure 1. (a) The displacement of GPS continuous station along Taiwan High Speech Rail (THSR) in the northeast side of Gunshuiping area from October 2015 to June 2018 with the reference point is KMNM in 2Kinmen, Taiwan (Chao, 2019). (b) InSAR line-of-sight velocity field based on ALOS images (Pathier et al, 2014)





Figure 3. Geologic map showing the location of research area (black rectangle) in Yanchao, Kaohsiung, Taiwan (modified from Central Geological Survey)



Figure 4. (a) Location of boreholes, RIP and stratigraphic correlation profile (b)The distribution of Topographic swath profiles along the mud volcanoes area

## IV. RESULTS AND DISCUSSION

