



## **Exploring geothermal structures in the Ilan Plain, Taiwan**

Chien-Ying Wang (1), Ruey-Chan Shih (2), Chen-Tung Chung (1), Ming-Zi Huang (2), and Hsuan-Yu Kuo (1)

(1) Institute of Geophysics, National Central University, Taoyuan City, Taiwan(wangcy@cc.ncu.edu.tw), (2) Institute of Applied Geophysics, National Chung Cheng University, Chia-yi County, Taiwan

The Ilan Plain in northeast Taiwan is located at the southwestern tip of the Okinawa Trough, which extends westward into the Taiwan orogeny. The Ilan Plain covered by thick sediments is clipped by the Hsuehshan Range in the northern side and the Central Range in the southern side. High geothermal gradients with plenteous hot springs of this area may result from igneous intrusion associated with the back-arc spreading of the Okinawa Trough. In this study, we use reflection seismic survey to explore underground structures in the whole Ilan Plain, especially in SanShin, Wujie, and Lize area. We aim to find the relationship between underground structures and geothermal forming mechanism.

The research uses reflection seismic survey to investigate the high geothermal gradient area with two mini-vibrators and 240-channel system. The total length of seismic lines is more than 30 kilometers. The results show that alluvial sediments covering the area about 400~600 meters thick and then thin out to the west in SanShin area. In SanShin, the Taiyaqiao anticline in Hsuehshan Range has entered the plain area and is bounded by the Zhuoshui fault (south) and the Zailian fault (north). In Wujie and Lize, Zhuoshui fault cut through a strong reflector which is the top of the gravel layer near the bottom of the alluvial layer, while the SanShin fault seems to cut near very shallow strata. These two faults are a strike-slip fault with a bit of normal fault component distributing over a range of 600 meters.

In Ilan Plain, the geothermal forming mechanism is controlled by anticlines and faults. The hydrothermal solution which migrates upward along these anticline or fault zones to the shallow part causing high geothermal gradients in these areas.