



Soil gas variations across a neotectonic fault in Northern Taiwan

W. L. Hong (1), S. J. Lin (2), V. Walia (1), C. C. Fu (1) and T. F. Yang (1)

(1) Department of Geoscience, National Taiwan University, Taipei, Taiwan, (2) National Center for Research on Earthquake Engineering, Taipei, Taiwan (b90204043@ntu.edu.tw / Fax: 886-2-23636095 / Phone: 886-2-33665876)

Soil gas method was carried out across a neotectonic fault in this work for two major purposes. First is to trace the surface distribution of Hsincheng fault, which was previously reported as an active fault in Hsinchu, northern Taiwan. Second is to study the relationship between neotectonic activity of the fault system and gas concentration variation.

Previous study showed that the latest slip record of the fault was ca. 300 years ago. However, the surface outcrops are difficult to find along the NE part of the fault. Furthermore, Hsinchu Science Park, the biggest science park in Taiwan, is close to the fault. Hence, the precise trace of the fault is urgent to know for further monitoring.

Soil gas survey was performed over an area of 30 km² across the fault system. Several profiles and more than 150 samples were collected for He, CO₂, CH₄, Ar, O₂ analysis, and some of the samples also measured the ²²²Rn concentration. One profile across the fault was set up in this study for continuous sampling to check the temporal variations of the soil concentration.

The spatial distribution of the anomalous concentration of He, CO₂, and ²²²Rn are used to recognize the fault trace in this area. The results show that soil gas anomalies can be always found at the same sites. The location is close to the trench site where paleoseismic evidence was found and confirmed that it is the surface trace of Hsincheng fault. Continuous monitoring indicates that soil gas variations at fault zone are closely related to the local crustal stress and hence, is suitable for further monitoring.