



Study of Fault Traces in Taiwan Using Soil-gas Geochemistry

Vivek Walia (1), Tsanyao Frank Yang (2), Ching-Chou Fu (2), Shih-Jung Lin (1), Kuo-Liang Wen (1,3), and Cheng-Hong Chen (2)

(1) National Center For Research on Earthquake Engineering, National Applied Research Laboratories, Taipei-106, Taiwan (vivekwalia@rediffmail.com, walia@ncree.narl.org.tw), (2) Department of Geosciences, National Taiwan University, Taipei-106, Taiwan, (3) Department of Earth Sciences and Institute of Geophysics, National Central University, Jhongli-32054, Taiwan

Active faults are important for several reasons. Active fault zones usually have a higher permeability than surrounding strata, therefore, provide conduits for the gases to migrate upward to surface from the deep sources. The spatial patterns of soil gases in fault areas appear to be suitable tool for identifying active tectonic structures. Spatial variations of soil-gas composition in the vicinity of some geologic fault zones of Taiwan were studied time to time in recent years. In the present study soil-gas surveys were conducted across the buried faults, to find out the location and regional activities of these fault systems. During these surveys soil-gas samples were collected along the traverses crossing the observed structures. The collected soil-gas sample bags are analyzed for various gas concentrations (He, Ar, O₂, CO₂, N₂) and isotopic compositions (³He/⁴He, $\delta^{13}\text{C}_{\text{CO}_2}$, and $\delta^{15}\text{N}_{\text{N}_2}$) in order to understand the origin of the soil gases. These systematic soil gas surveys across active faults provide the opportunity to closely examine the mechanism of gas migration in these fault zones.