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Continuous Soil-gas Monitoring for Earthquake Surveillance and its Tectonic Implications in Taiwan

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The island of Taiwan is a product of the collision between Philippine Sea plate and Eurasian plate which makes it a region of high seismicity. Active subduction zones occur south and east of Taiwan. After the destructive Chi-chi earthquake (MW = 7.6, Sept. 21, 1999) an accelerated phase of geochemical monitoring started in Taiwan. Measurement of soil-gas emissions along active zones is characterized as a geochemical tool to identify and monitor tectonic activity in the region. Geochemical variations of soil-gas composition in the vicinity of geologic fault zone of Northeastern and Southwestern parts of Taiwan have been studied in detail recently. To carry out the investigation, temporal soil-gases variations are measured at continuous earthquake monitoring stations established along different faults. Results show significant temporal variations in these parameters before and after some major earthquakes. Geochemical observations at different monitoring stations and their correlation with seismotectonic activities indicate that different faults zones are disturbed by different tectonic settings. Geochemical monitoring network with sensitive sites in the vicinity of selected geologic fault zones help us to monitor the seismotectonic activities in the region.