



Seismic and Geochemical Monitoring in the Tatun Volcano Group, Northern Taiwan

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Tatun volcano group (TVG) without any eruption record in the human history is recognized as an active volcano evidenced by seismic and geochemical signals of magmatic activities. The necessity of refining the present long-term volcanic monitoring system is further stressed by the possibly youngest eruption age of about 6 ka (Belousov et al., 2014) or even less than 1,370 BP published by Zellmer recently.

By deploying tens of seismicity stations and selecting suitable sites for chemical measurement among the TVG, the integrated networks detect earthquakes in the crust and fluid compositions from mantle to investigate volcanic features and subsurface structures in the northern Taiwan. Several shallow low-velocity zones discovered beneath the TVG indicate significant hydrothermal activities near the surface. Based on pre-slips, very-long-period seismic earthquakes and seismic swarms occasionally occurred in the TVG, the volcano-related hydrothermal activities of the TVG remain fairly energetic. Besides, the continuous and regular chemical measurements of volcanic gases and hot springs on geothermally-active sites are combined with seismic data to grasp the volcanic unrests beneath the TVG. Mostly, the results show no significant anomaly which implies that the TVG are stable. These observational data are not only the key to understand subsurface geometry of the TVG, but also a reliable reference of the volcanic hazard assessment and geothermal resource exploration.