

## **Exploring the release of radioactive material in the volcanic area and its tectonic implications**

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Taiwan is tectonically situated in a terrain resulting from the oblique collision between the Philippine Sea plate (PSP) and the Eurasian plate (EP). The continuous observations of gamma rays at the YMSG station and soil radon at the TPT station are recorded in volcanic area and around a major fault zone, respectively, in north Taiwan for the volcanic and seismic studies. A number of anomalous high gamma-ray counts and radon concentrations at certain times can be found. It is noted that significant increase of soil radon concentrations can be observed and followed by the increase in gamma rays a few days to a few weeks before the earthquakes, which occurred in northeastern Taiwan. These earthquakes are usually related to the subduction of PSP beneath EP to the north along the subduction zone in northern Taiwan (e.g.,  $M_L=6.4$  April 20, 2015). It is suggested that the pre-seismic activity of an earthquake may be associated with slow geodynamic processes at the subduction interface, leading to the PSP movement to trigger radon enhancements at TPT station. Furthermore, the further movement of PSP may be locked by the EP and accumulated elastic stress results in the increase of gamma rays due to the increase in porosity and fractures below the YMSG station. The continuous monitoring on the multiple parameters that help detect the subtlest signals unrest to improve the understanding of the crustal stress/strain variations in volcanic area and northeastern Taiwan.