

Geochemical evidence for the occurrence of 2018 Hualien earthquake triggered by earlier earthquake swarm

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The continuous observations of soil radon for earthquake studies at the Tapingti station (TPT) have been recorded and are compared with the data from gamma rays observations at the Taiwan Volcano Observation station (YMSG), located north to the TPT station. The previous significant increases of gamma rays and radon were observed at both stations before the earthquakes, which occurred in eastern and northeastern Taiwan, suggest that anomalies in gamma and radon may provide the good indicator for exploring earthquake precursor in eastern Taiwan. A Mw 6.4 Hualien earthquake struck eastern Taiwan on 6 February 2018. Based on seismological studies, this earthquake may be triggered by the earthquake swarm that shook eastern Taiwan on 4 February 2018. In this study, both stations recorded significant changes about two weeks before the Hualien Earthquake. However, we provide the possible evidences from geochemical data for the occurrence of 2018 Hualien earthquake was triggered by earlier earthquake swarm. The continuous monitoring on the multiple parameters can improve our understanding of the relationship between the observed radon and gamma-ray variations and the regional crustal stress/strain in the area.