

## **Unveiling seismogenic structures along the deformation front of the Taiwan orogen through seismic network observations**

**Yu-Chih Huang<sup>1</sup>**, Strong Wen<sup>2</sup>, Da-Yi Chen<sup>3</sup>, Che-Min Lin<sup>1</sup>, Hung-Hao Hsieh<sup>1</sup>,  
Chih-Wei Chang<sup>1</sup>

<sup>1</sup> National Center for Research on Earthquake Engineering, NARLabs, Taiwan

<sup>2</sup> Department of Earth and Environmental Sciences, National Chung Cheng University, Taiwan

<sup>3</sup> Seismological Center, Central Weather Administration, Taiwan

Taiwan is located at a convergent plate boundary, where the Philippine Sea plate interacts with the Eurasian plate, leading to intense seismicity and complex tectonics processes. The Western Coastal Plain and Western Foothills align with the deformation front of the Taiwan orogen, featuring highly active faults and a complex seismogenic structure that has historically caused significant damage. It is noteworthy that distinct rupture patterns and damage distribution characterize these different fault types. Therefore, it is crucial to evaluate the activity level of each fault and understand their interrelationships. Moreover, the densely populated cities on the western plains face threats due to their location on thick alluvium, making them susceptible to seismic-wave amplification and soil liquefaction. We conducted an analysis of data from several temporary seismic networks across different time periods, incorporating both broadband and short-period seismometers. The objective was to increase the density of seismic stations, resulting in improved lateral resolution and enhanced background seismic activity and velocity models. Examining the correlation between seismic activity and seismogenic structures enhances our understanding of potential seismic hazards. The research findings serve as a valuable reference for earthquake damage assessment and regional seismic disaster management, contributing to efforts to mitigate potential risks from future earthquakes.

Keywords: seismogenic structure, deformation front, Taiwan orogen, seismic network