

## Controls of repeating earthquakes' location from a- and b- values imaging

\*Masashi Kawamura<sup>1</sup>, Kate Huihsuan Chen<sup>1</sup>

1. Department of Earth Sciences, National Taiwan Normal University

To explore where earthquakes tend to recur, we statistically investigate repeating earthquake catalogs and background seismicity from different regions. We show that the location of repeating earthquakes can be mapped by the spatial distribution of the seismic a- and b-values obtained from the background seismicity. With statistical significance confirmed by Molchan' s error diagram, repeating earthquakes are found to occur within the areas with higher a-values (2.8-3.8) and b-values (0.9-1.0) on both strike-slip and thrust fault segments (Parkfield, Hayward, Calaveras, and Chihshang faults). The significant association however, does not hold true for fault segments with more complicated geometry or wider areas with a complex fault network. The productivity of small earthquakes that is responsible for both high a- and b-values, therefore, is likely the most important factor that controls the location of repeating earthquakes. Since such condition is commonly found in creeping fault, we propose that it requires a specific fault property for the repeating earthquakes to show a universal association with a- and b-values.

Keywords: repeating earthquake, a-value, b-value, creeping fault, California, Taiwan