



## **Exhumation History of the Northern Hsuehshan Range and its tectonic implication**

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The northern Hsuehshan Range is situated between the boundary of subduction and collision. To the northeast, the Philippine Sea Plate is subducting northwardly beneath the Eurasian Plate; to the south, the Eurasian Plate is colliding with the Philippine Sea Plate. According to the oblique collision modeling, the Taiwan orogenic belt started to build from the north and progressively propagated southward at a rate of 60-90 km/my. This model infers that the timing of mountain would be early in the northern mountain.

In this study we used fission track dating to reveal when the Hsuehshan Ranges started to exhumation and what deformation mechanism controlled the exhumation history.

The reset ages of apatite fission track are from  $2.6 \pm 0.4$  Ma to  $1.2 \pm 0.3$  Ma and ages decreases from west to east that indicates increasing exhumation rate from west to east. We considered that the variation of the exhumation rate from west to east is controlled by geometry of the detachment with different ramp-flat structure in depth. The oldest reset ages of apatite fission track are similar from north to south of the Hsuehshan Range that indicates the initial timing of exhumation is similar from north south that indicates there is no southward propagation effect to the Taiwan Orogenic Belt. The total exhumation amount is less in the northern Hsuehshan Range that could result from that the slip rate of the detachment is slow and it results from changing the tectonic setting from collision to subduction in northern Taiwan.