



The Thermal- Mechanical Evolution of Mid-Hsuehshan Range, Taiwan: Through Numerical Modeling and ZFT Ages

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In this study, we aim to investigate the subsurface structure and lithology distribution in mid-Hsuehshan area through thermochronological dating of zircon fission track (ZFT) and 2D numerical modeling. Taiwan is an orogenic belt on the boundary between the Philippine Sea plate and the Eurasia plate. Located in central Taiwan, the NNE-SSW trending Hsuehshan Range (HR) is the second largest range with high denudation rates (another one is Central Range (CR)). In most previous studies, the forward modeling results cannot simulate this second peak except Simoes et al. (2007). However, they approached this phenomenon by assuming two underplating windows in their numerical model. In order to loosen the knot, we measured 6 new ZFT ages at the different heights of HR and computed the 2D thermal-mechanical evolution of HR based on the subsurface lithology and structure distribution of previous studies. We tested the assumption of tectonic framework by comparing the modeling result with field ZFT ages. We found that models with a protrusion of continental crust underneath the CR fit the data constraints best. The protrusion of the continental crust causes the relative low denudation rate in the area between HR and CR, which leads to the single peak of denudation rate to be divided into two in northern Taiwan.

Keywords: Taiwan; Hsuehshan Range; Thermal-mechanical model; Zircon fission track; Continental crust.