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Thermal-metamorphic evolution of the slate terrane in the central part of the active Taiwan mountain belt

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Taiwan sits on the convergent plate boundary between the Eurasian and the Philippine Sea plates, and the on-going arc-continent collision is regarded a modal locality for studying mountain building processes. For detailed reconstruction of the structure and development of the orogenic system, metamorphic history of the sedimentary cover over subducted crystalline basement is crucial for quantitative constraints, since the pre-orogenic position and attitude of the meta-sediments can be estimated and syn-orogenic evolution quantified through thermochrons and geothermometers such as Raman spectrum of carbonaceous material (RSCM). Taiwan slate belt is composed by two geological units, Hsuehshan Range (HR) and Backbone Range (BR) which are composed by Eocene to Miocene passive margin sequences. The two units are characterized by contrasting deformation styles (pure vs. simple shear-dominated) and patterns of metamorphic temperature, therefore a boundary fault, the Lishan Fault, has been proposed between HR and BR. However, the existence and geological meaning of the Lishan Fault are still in dispute, and what's the role of the Lishan Fault in the Taiwan mountain building processes?

In this study, field structural observations and RSCM sampling are carried out in the central Taiwan. Around 40 rock samples have been collected along the strike of the Lishan Fault with a dense interval about 1 km. The results allow us to map the localities and estimate vertical offsets across the Lishan Fault through peak temperature distribution, and provide new constrains for reconstructing the structure and evolution of Taiwan orogeny.