

A Major out of Sequence fault in Central Range of Taiwan Orogenic belt

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Taiwan mountain belt results from collision between Eurasia continental crust and Philippine Sea plate that result in exposing the metamorphic complex with high exhumation rate in eastern Central Range of Taiwan orogenic belt. In this study we combine with field survey, zircon fission track (ZFT), metamorphic grade, and tomography image to identify there exists a major out of sequence fault (MOSF) in eastern Central Range of Taiwan orogenic belt. This MOSF can be separated into three segments and it extends from north to south of central Range and the total length is more than 250 km. The ZFT shows total annealing age of ca. 1-3 Ma on the hanging wall and partial annealing ages on the foot wall. The exhumation rate is ca. further acceleration in exhumation from ca. 0.5 Ma to present (4-8 mm/yr). The seismicity data indicates the MOSF is still active from central to southern central Range.

We consider that the MOSF is related with crustal channel flow in depth. To the western side of crustal flow it shows thrusting mechanism associated with MOSF and the normal faults (or normal shearing zone) develop in eastern side of the crustal channel flow. This crustal channel flow is also related with exposing the metamorphic complex in Central Range that is important mechanism for the mountain building process of Taiwan orogenic belt.

Keywords: Taiwan Orogenic belt, out of sequence fault, thermochronology