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Strain Pattern inferred from AMS across the Southern Portion of the Central Range, Taiwan

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Taiwan orogen is a classical mountain belt resulted from on-going arc-continent collision between the Eurasian Plate and the Philippine Sea Plate. During the building period of Taiwan Central Range, multiple orientation cleavages superposed on the former cleavages, leading that the cleavage across entire Central Range displays fan-like distribution. Stretching lineation also rotates from orogen-normal to orogen-parallel from west to east across the Central Range. These orogen-related structures bring up the research question: What are the magnitudes and orientations of multiple deformation events of Taiwan Central Range? Previous studies have utilized pyrite pressure shadows as strain marker to estimate the incremental or finite strain. However, the pressure shadows for strain analysis were only suitable to the slate, not to the schist in the east Central Range. In this study, we depict the finite strain pattern inferred from magnetic fabrics across the Central Range, including the western slate belt, Tailuko belt, Shoufeng fault, Yuli belt and eastern slate belt along the South Cross-Island Highway, Taiwan. Anisotropy of Magnetic Susceptibility (AMS) is an efficient tool to analyze the finite strain and characterize petrofabrics and structures. AMS experiments measured the principal directions and values of magnetic susceptibility ellipsoid, and further evaluate the degree of anisotropy and ellipsoid type. Our preliminary results include 6 key points: (1) The magnetic fabrics are consistent with tectonic fabrics. (2) From one mesoscale shear zone outcrop, the AMS result implies that the corrected anisotropy larger than 1.4 might indicate the high deformation. (3) Maximum magnetic susceptibility axis (K1) rotates from orogen-normal to orogen-parallel from west to east across the Central Range. (4) Anomalous high values of corrected anisotropy (Pj > 1.4) could reflect the regional high-strain zone. (5) The corrected anisotropy values decrease gradually from west to east across the Central Range, after eliminating the anomalous high corrected anisotropy. (6) High corrected anisotropy, which might represent the regional high-strain zone, are ellipsoidal shape. On the contrary, most samples are oblate-like magnetic susceptibility ellipsoids.

Keywords: Anisotropy of Magnetic Susceptibility; Central Range; Shoufeng fault; Taiwan orogen