ANISOTROPIC DEFORMATION AND ROTATION TECTONICS DURING OBLIQUE CONVERGENCE: EXAMPLES FROM NORTHEASTERN TAIWAN

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The recent tectonic evolution of the Taiwan Mountain belt is mainly controlled by both the oblique convergence between the Eurasian plate and the Philippine Sea plate and the corner shape of the plate boundary. Based on field investigation, tectonic analysis and paleomagnetic study, we characterize the structures and reconstruct the evolution of the deformation at this northeastern tip of the Hsuehshan Range fold-and-thrust belt. Paleomagnetic analysis in folded strata indicates probable contraction-induced remagnetization of remanent magnetization. Three deformation stages can be distinguished, which include (1) an early contraction and volume loss stage that resulted in thrusting, regional tilting of strata and subsequent folding, formation of sand dikes, basaltic dikes and remanent magnetization, (2) a second stage dominated by oblique simple shear, that resulted in widespread dextral shear associated with regional bending of the belt segment in the horizontal plane, drag folds accompanying progressive thrusting with domino- and bookshelf-type strike-slip fault systems and a variety of transpressional structures (3) a third stage of steady-state compression, in association with pop-up structures, that essentially produced backthrusts, as well as penetrative pencil structure and fracture cleavage with a constant NNE-SSW orientation. This has resulted in a rather simple structural pattern of ductile structures and a complex structural pattern of brittle structures A general model of transpression is proposed to account for the kinematics of this area.