Continental-Margin Fracture Zone Reactivation: The Taiwan Arc-Continent Collision

A continental margin fracture zone in the lower plate of west central Taiwan exerts a major control on active orogenesis in the Taiwan orogen. The role of lower-plate architecture is constrained through seismotectonic inversions and kinematic analyses of exposed upper-plate fault zones. Inversions of upper-plate seismic focal mechanisms at the SW margin of the Hsuehshan Range indicate that the upper crust inboard of a lower-plate promontory reflect both fine spatial-scale partitioning of distinct strain geometries and possible block rotations. The dominant non-recoverable strain is horizontal stretching oriented WSW, approximately parallel to the orogen. Recently completed field studies across an inferred lower-plate fracture zone reveal reactivation of upper-plate faults in the accommodation of differential uplift between the Hsuehshan Range and the lowlands of the Puli Basin and western foothills to the SW. Post-cleavage faults with non-optimal geometries appear to have been reactivated to accommodate sinistral reverse slip with transport toward the WSW, oblique to the contemporary GPS velocity field. The results suggest that inherited lower-plate architecture plays a fundamental role in the evolution of the Taiwan arc-continent collision.