



Transient phases of strike-slip deformation between extension and contraction

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Phases of strike-slip deformation tend to occur in the transitions from both orogenesis to orogenic collapse and from basin development to inversion. Strike-slip faults are commonly developed late in the contractional history of orogenic belts, both in the highly strained interior and the gently deformed foreland. These late strike-slip faults form when the intermediate compressive stress (σ_2) is vertical, and represent the transition from vertical least compressive stress (σ_3) during thrusting and folding, to vertical maximum compressive stress (σ_1) during orogenic collapse. The transition to strike-slip faulting is caused either by an increase in overburden during contraction or by along-strike extension. Where σ_1 is perpendicular to the orogenic belt, symmetric conjugate strike-slip faults develop and represent strike-perpendicular shortening and strike-parallel extension. If σ_1 is at less than $\sim 70^\circ$ to the strike of the orogenic belt, asymmetric conjugate strike-slip faults develop, with one set at a low angle to bedding.

The transition from basin development (σ_1 vertical) to basin inversion (σ_3 vertical) can involve a phase of strike-slip faulting (σ_2 vertical) as the maximum horizontal stress increases. These strike-slip faults can influence the kinematics of subsequent inversion and orogenesis.