Fault-Related Folding: A Review of Kinematic Models and their Application

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Fault-Related Folding: A Review of Kinematic Models and their Application

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Abstract

Folding that is directly related to fault activity is an important deformation feature that occurs all over the world in mountain belts, accretionary wedges, fold-and-thrust belts, and intra-plate settings in either strike-slip, compressional, or extensional regimes. Due to their widespread occurrence, knowledge about the development of these structures is important to a broad spectrum of geoscience sub-disciplines, such as structural geology, seismology, geomorphology, petroleum geology, and Quaternary geology. Fault-related folding has been analysed intensively over the last 140 years. For the sake of this review, we divide the folds up according to the way the faults and the folds form; that is into detachment, fault-bend, and fault-propagation folds.

All fault-related folds are caused by changes in fault parameters. The simplest method to produce folds is to transport material along faults that have stepped, flat-ramp-flat geometries (fault-bend fold). Alternatively the slip can decrease along the length of the fault, and depending on whether the fault remains within a detachment layer or steps up through mechanical stratigraphy, either a