

Fault Patterns of the Gulf of Corinth: Experiment and Modeling

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In this paper the possibility is examined of a kinematical connection between the set of conjugate, high-angle normal faults and the hypothesized gently dipping "detachment zone" (Rigo et al. 1996) in the Gulf of Corinth. This hypothesis is tested here through small-scale sand-box experiments and numerical modeling. Both methods seem to support that the high-angle faults initiate either at the tip of the inclined base plane nearest to the free surface or at the transition point from a frictionless to a frictional interface. Both fault-initiation mechanisms may be attributed to earthquake motion that results in stress-relaxation and migration of slip activity along the detachment zone. The faults propagate upwards with increasing displacement on the inclined base, resulting in a symmetrical half-graben configuration. Subsequent sliding on the inclined base induces a second antithetic fault that is responsible for the observed asymmetry of the final half-graben.