

Deformation of unconsolidated sediments caused by bedrock fault movements in model experiments

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The fault model tests simulating normal, reverse and strike-slip faults by changing the parameter of the fault type, fault dip, fault displacement, thickness of sandpack and grain size of sand were performed to study the deformation of unconsolidated sediments caused by bedrock fault movements. En echelon shear bands at normal and reverse faulting and linear valley or trough at strike-slip faulting were observed in the large sandbox experiments. The normalized horizontal distance of surface rupture from the bedrock fault in the tests agrees well with that of earthquake faults. Computerized X-ray tomography applied to sandbox experiments makes it possible to analyze the kinematic evolution, as well as the three-dimensional geometry, of faults in basement-controlled wrench faulting.