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# Mechanics of Fault/Rollover Systems Developed on Passive Margins Detached on Salt: Insights from Analogue Modelling and Optical Strain Monitoring

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**Abstract**

We apply scaled analogue experiments of brittle-ductile systems to simulate development of listric fault/rollover structures during gravitational spreading of passive margins. Experiments were run with different sedimentation rates and scenarios in order to evaluate the interaction of sedimentation and faulting. Our results indicate that the kinematics of listric fault/rollover systems is strongly related to sedimentation patterns and rates. Differential loading governs the state of stress in the experiments and the individual strain history of fault structures. This is reflected by the characteristic succession of structural styles that evolve from symmetric grabens through early, mature and late (collapsed) basinward listric fault/rollover systems into landward listric fault/rollover systems. A lack of sedimentation enhances reactive diapir rise and passive diapirism in a dynamically unstable passive margin sedimentary wedge. Low sedimentation rates favor development of long-lived basinward listric fault/rollover systems. Conversely, high sedimentation rates support rapid development of landward listric fault/rollover systems. In summary, the structural patterns of listric fault/rollover systems in certain cases have the potential to give insights into the dynamics of depositional systems.