

Mechanics, Structure and Evolution of Fault Zones

Edited by
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Considerable progress has been made recently in quantifying geometrical and physical properties of fault surfaces and adjacent fractured and granulated damage zones in active faulting environments. There has also been significant progress in developing rheologies and computational frameworks that can model the dynamics of fault zone processes. This volume provides state-of-the-art theoretical and observational results on the mechanics, structure and evolution of fault zones. Subjects discussed include damage rheologies, development of instabilities, fracture and friction, dynamic rupture experiments, and analyses of earthquake and fault zone data.

From the Contents:

Structural properties and deformation patterns of evolving strike-slip faults: Numerical simulations.- Segmentation along strike-slip faults revisited.- Influence of outcrop scale fractures on the effective stiffness of fault damage zone rocks.- Effects of off-fault damage on earthquake rupture propagation: experimental studies.- Geometry of the Nojima fault at Nojima-Hirabayashi, Japan - I. A simple damage structure inferred from borehole core permeability.- II. Microstructures and their implications for permeability and strength.- The energetics of cataclasis based on breakage mechanics.- Chemical and Physical Characteristics of Pulverized Tejon Lookout Granite Adjacent to the San Andreas and Garlock Faults.- Characterization of damage in sandstones along the Mojave section of the San Andreas Fault.- Constructing constitutive relationships for seismic and aseismic fault slip.- Non-planar faults: Mechanics of slip and off-fault damage.- Characterization of Fault Roughness at Various Scales: Implications of 3-D High Resolution Topography Measurements.- Spatio-temporal slip, and stress level on the faults within the western foothills of Taiwan.- Landslides, Ice Quakes, Earthquakes: A Thermodynamic Approach to Surface Instabilities.

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