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Seismic and Aseismic Deformation in the Brittle Crust

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Message from the Guest Editors

Dear Colleagues,

Brittle deformation represents the primary mode of deformation of Earth's crust. Recent observations suggest that seismogenic faults accommodate tectonic plate motion through a wide variety of slip modes, ranging from earthquakes to slow aseismic slip. Aseismic slip releases elastic energy slowly without radiating seismic waves and plays an important role in the initiation, propagation, and arrest of large earthquakes. Other factors, such as the presence of fluids, stress, and fault material heterogeneities, also play an important role in the fault mechanics. Understanding the physics and the energy partitioning between seismic and aseismic slip on faults at all scales and in various tectonic settings is essential to assess their impact on the seismic cycle. To improve our comprehension of seismic and aseismic deformation in the brittle crust, we invite contributions that explore the themes described herein through geophysical and geological observations, laboratory experiments, numerical modeling, and multidisciplinary approaches.

- brittle deformation
- seismic–aseismic slip partitioning
- stress interactions
- pore fluid diffusion
- fault rheology

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Message from the Editor-in-Chief

Understanding the Earth's origin and its bio-geological evolution, the multiple implications of the geosciences (as a coherentset of interconnected disciplines), and the sociocultural and ethical interdisciplinary approaches, will be crucial for a better understanding of Nature, and also for undertaking scientificallybased political decisions.

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