Geophysical Research Abstracts
Vol. 12, EGU2010-8599, 2010
EGU General Assembly 2010

On the healing rate of a reactive interface

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Assessing the healing rate of a fault is relevant to the knowledge of the seismic machinery. We investigate the relative roles of interface reactivity and sliding velocity on the healing rate. Slide-hold-slide experiments (SHS) are conducted on a bare interface with various materials in contact (glass/glass, salt/glass, salt/salt) with or without the presence of fluids (water or saturated brine depending on the nature of the materials in contact). The interface strengthens with the logarithm of hold time, whatever the conditions. No cutoff time was observed at the shortest measurable timescales. We show quantitatively that the reactivity of the interface strongly affects the healing rate.