



Interseismic activity and the time stability of plate coupling constants west of Sumatra.

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The degree to which plates are locked or slipping aseismically has long been recognised as a fundamental control on the long term assessment of seismic risk. It is clear that zones of aseismic slip on major faults will not only contribute little to the energy of future earthquakes but will also act as strong barriers to rupture propagation placing strong limits on the along strike extent of large or great earthquakes. Recent analysis of interseismic deformation on the Sunda megathrust to the west of Sumatra has used both GPS measurements and the stratigraphy of intertidal coral heads to invert for the distribution of coupling along the plate boundary. Whereas the rupture of the great 2005 earthquake appears to have well predicted by this distribution, the slip distribution of the 2007 earthquake appears to experienced a weaker control. Clearly, the mapping between coupling constants and moment release is of great interest in attempts to forecast the next earthquakes in the region. Here we ask: Have the coupling constants along the Sunda megathrust been constant over the earthquake instrumental period? We compute the distribution of interseismic stresses which would result from the present coupling map and compare it to the interseismic activity both on the megathrust and in the surrounding crust.