



Co-seismic stress variability and its control on seismicity

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The occurrence of an earthquake relieves the loading stress over the main fault, yet this is where vigorous aftershock production generally takes place. On-fault stress heterogeneity can be shown to be a natural candidate for explaining these observations. The question remains as to whether off-fault seismicity can also be controlled by the roughness of the stress field, and what indeed causes this stress to be rough. Using a rate-and-state friction model to relate stress and seismicity changes, we investigate whether stress variability can be measured from seismicity evolution. This is done for the 1999 Chi-Chi earthquake, especially for those areas that were found by Ma et al. (JGR, 2005) to experience seismicity shadows. Inversion of the mean and standard deviation of the stress distributions for these areas is performed, for a set of triggers (including the Chi-Chi earthquake itself) so to fit the data. Evidence for partial control of the off-fault seismicity by stress variability is observed.