



Exceptional ground motions and implications for the ground motion generating processes

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A compilation of the strongest records of earthquake ground motion has organized 277 records in which either the peak acceleration (PGA) exceeds 500 cm/s² or the peak velocity (PGV) exceeds 50 cm/s on at least one component. The peak acceleration and velocity have been assigned a rank within this compilation, with the strongest given rank 1, the second strongest rank 2, etc. The plot of PGA vs. rank is more consistent with a power law distribution, while the plot of PGV vs. rank is more consistent with an exponential distribution. Most of the strongest records in the database come from stations located on the hanging wall of crustal thrust faults, with possible implications for earthquake source mechanics (e.g. Brune, 2001), although more mundane explanations related to the uniformity of the sampling still need to be considered. The presentation will consider physical processes affecting several of the strongest records.