The Turkey-Flat strong motion "blind" prediction experiment

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This is a part of the international blind prediction experiment (California Geological Survey, 2005) of the M6, Sep. 28, 2004 Parkfield earthquake. Strong motion data at Turkey flat site, based on knowledge of real records from two stations (R1, D3, respectively), are predicted. Acceleration time histories, Fourier spectral ratios, peak ground motion values, and response spectra at other stations (R2, V1, V2, D1, D2, D3), inside or around a shallow stiff-soil sedimentary valley of Turkey Flat, are studied. In contrast to the most widely used philosophy of experiments like this, where main focus is on local site effects while the excitation is represented by plane incident waves, our trick is to emphasise the source effect. The available strong motion data (CISN) at R1 are modelled. Composite-source predictions utilized a non-uniform fault slip distribution (Ji, 2005).

Local effects are treated in simplified way using individual 1D models below each receiver. Such simplified treatment is possible since the 3D structural heterogeneity is small. Our predictions combine the fault rupture, crustal wave propagation, and 1D local site effects, at 0 to 40 Hz band.