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## Prediction of Near-source Ground Motion for the 2004 Mw 6.0 Parkfield Earthquake: Effects of Using Different Data Sets in the Inversion

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The near-source region of the Mw 6.0 Parkfield earthquake was singularly well covered by seismic instruments: 56 three-component strong-motion accelerographs and a high-resolution 13-element array (UPSAR) were located within 20 km of the fault. Such abundance of near-source records is unprecedented and provides an exceptional opportunity to test inversion methods. We test the effect of using different data sets in inverting ground motion for source parameters. In particular, we study the effect of using stations located at different distances from the source. We divide the available data set into two groups, assuring that each group provides an equally good azimuthal coverage of the source region. One of the groups (data A) is predominantly constituted by the stations closest to the fault, whereas the stations farther away are the bulk of the second group (data B). First we invert data A to find a model for the earthquake, and then use that model to predict ground motion at the stations in Group B. Next we reverse this process and invert data B and predict Group A. An open question is whether the predicted ground motion has the same goodness of fit as those found by inversion. Our inversions are based on a global inversion method (Liu and Archuleta, 2004) where the fault is divided into several subfaults and the slip amplitude, rake angle, rise time, and rupture velocity are found at the nodes (corners) of each subfault with bilinear interpolation within a subfault. At present we use two different layered models for the velocity structure for different sides of the fault. Comparison between the two inversions will help in determining which aspects of the inversion are robust, i.e., most probably describe reality. Future work involves using full 3D Green's functions as well as dividing the available data set into groups with criteria other than distance to source.

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