



## SSA 2007 Abstracts Online

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**Session:** Rupture Dynamics

**Schedule:** Fri PM

**Presenter:** Custodio, Susana

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### **COMBINING DIFFERENT DATASETS TO OBTAIN A RUPTURE MODEL: THE 2004 M6.0 PARKFIELD EARTHQUAKE**

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A reliable image of the seismic source (i.e., a map of the slip evolution during an earthquake) is one of the most wanted results in seismology. In the last decades there have been great advances in imaging earthquake sources, due mainly to improvements in data quality, data coverage, inversions methods and computing resources. However, inversions for rupture models based on different datasets often yield different results. The reason for this disparity is probably the different resolution abilities of the different datasets, but this issue remains to be thoroughly studied. The lack of consistency between rupture models for a given earthquake has led to a skeptical attitude of the scientific community toward finite source models. Our work focuses on combining different datasets to obtain a rupture model for the 2004 Mw 6.0 Parkfield Earthquake, in such a way as to take advantage of the specific information contained in each dataset. The Parkfield earthquake is perfect for this study due to the great amount, quality and diversity of data it generated. We will combine information provided by strong-motion seismic data, 1-Hz GPS data, and seismic data from a short-baseline array (UPSAR). The main inversion will be based on strong-motion data the most rich and complete dataset available to image the earthquake. The static GPS data will be used to constrain the slip amplitude. The weight and use of the GPS data will depend on its resolution, length-scale and error, rather than on arbitrary weights (as is commonly done). The UPSAR data will be used to constrain the rupture velocity at given points on the faults. We finally obtain a rupture model that describes the earthquake in terms of slip amplitude, slip rake, rupture velocity and rise time. Our work explains the disparities observed between rupture models obtained from different datasets.

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