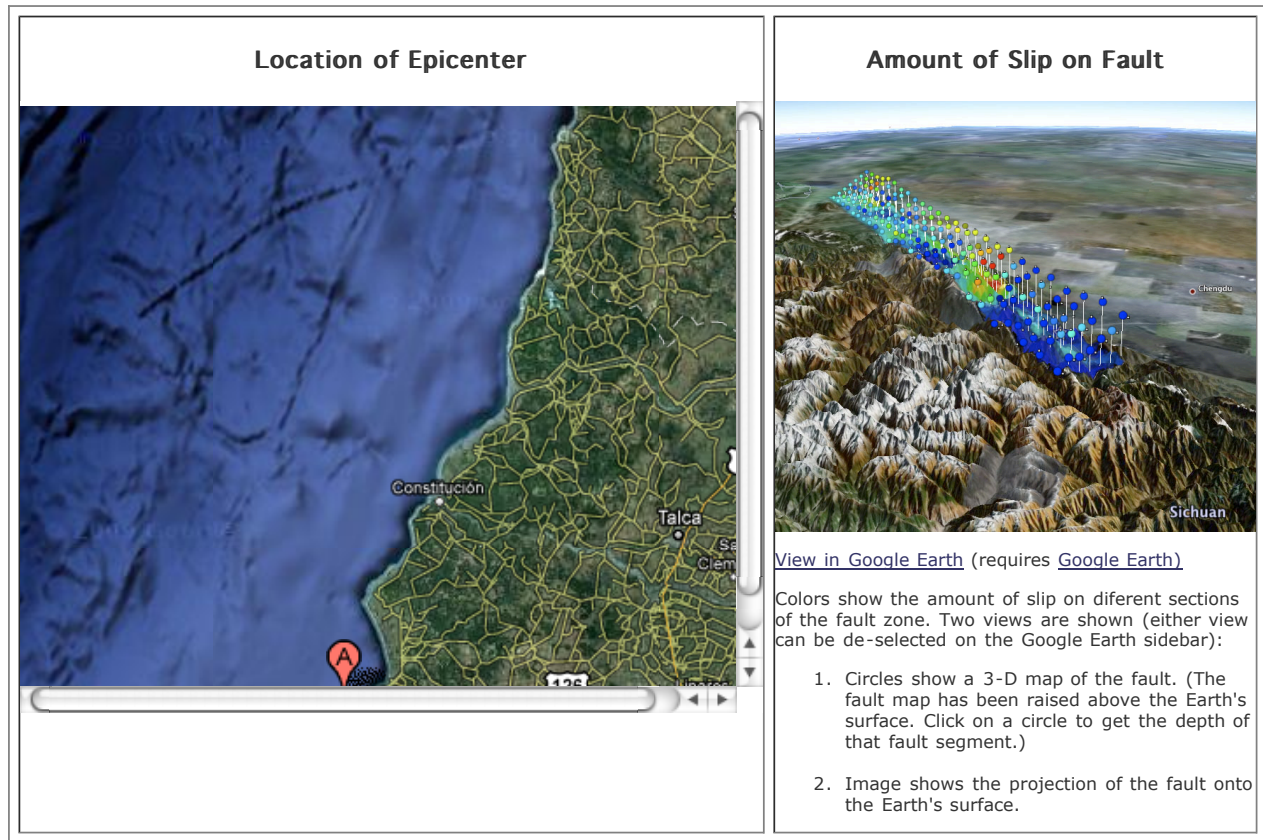


[Back to Slip Maps for Recent Large Earthquakes home page](#)

Preliminary Result 02/27/2010 (Mw 8.8), Chile

[Anthony Sladen](#), Caltech



DATA Process and Inversion

We used the GSN broadband data downloaded from the IRIS DMC. We analyzed 24 teleseismic P waveforms selected based upon data quality and azimuthal distribution. Waveforms are first converted to displacement by removing the instrument response and then used to constrain the slip history based on a finite fault inverse algorithm (Ji et al, 2002). The epicenter location is based on the USGS estimate (Lon.=-72.719 ° Lat.=-35.846 ° depth=35 km). The focal mechanism is taken from the GCMT solution (strike=18 °, dip=18 °) and the 1D velocity model is extracted from the CRUST2.0 global tomography model (Bassin et al., 2000).

UPDATE: Preliminary solution combining teleseismic and IGS GPS points available [here](#).

Result

The solution is made of one major slip patch stretched about 20 km west and updip from the epicenter. The slip is mostly left-lateral, with a significant component of thrust motion.

Cross-section of slip distribution

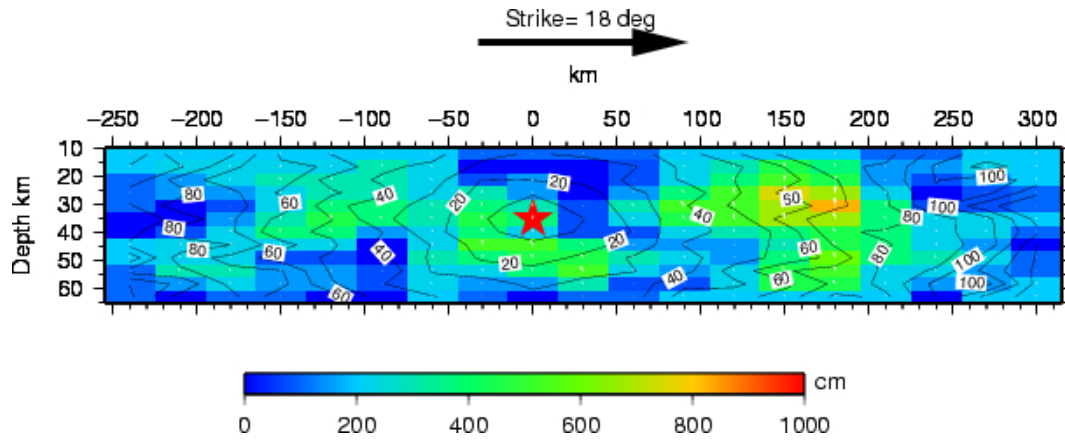


Figure 1: The colors show the slip amplitude and white arrows indicate the direction of motion of the hanging wall relative to the footwall. Contours correspond to the propagation of the rupture front, and the red star indicates the hypocenter location. The big black arrow gives the orientation of the fault plane.

Comparison of data and synthetic seismograms

Teleseismic P waveform fits

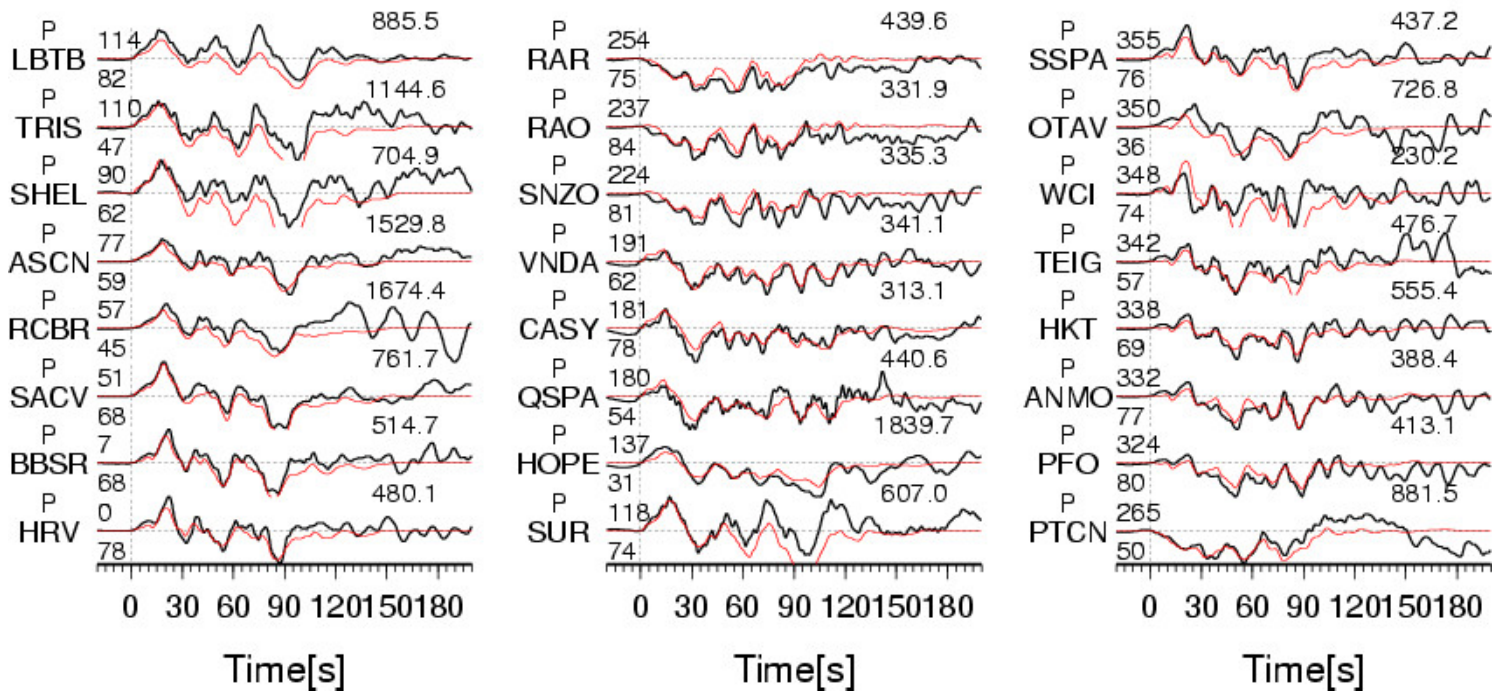


Figure 2: The Data are shown in black and the synthetic seismograms are plotted in red. Data are aligned on the theoretical P-wave arrival (IASPEI earth model). The number at the end of each trace is the peak amplitude of the observation in micro-meter. The number above the beginning of each trace is the source azimuth and below it is the epicentral distance.

Map view of the slip distribution

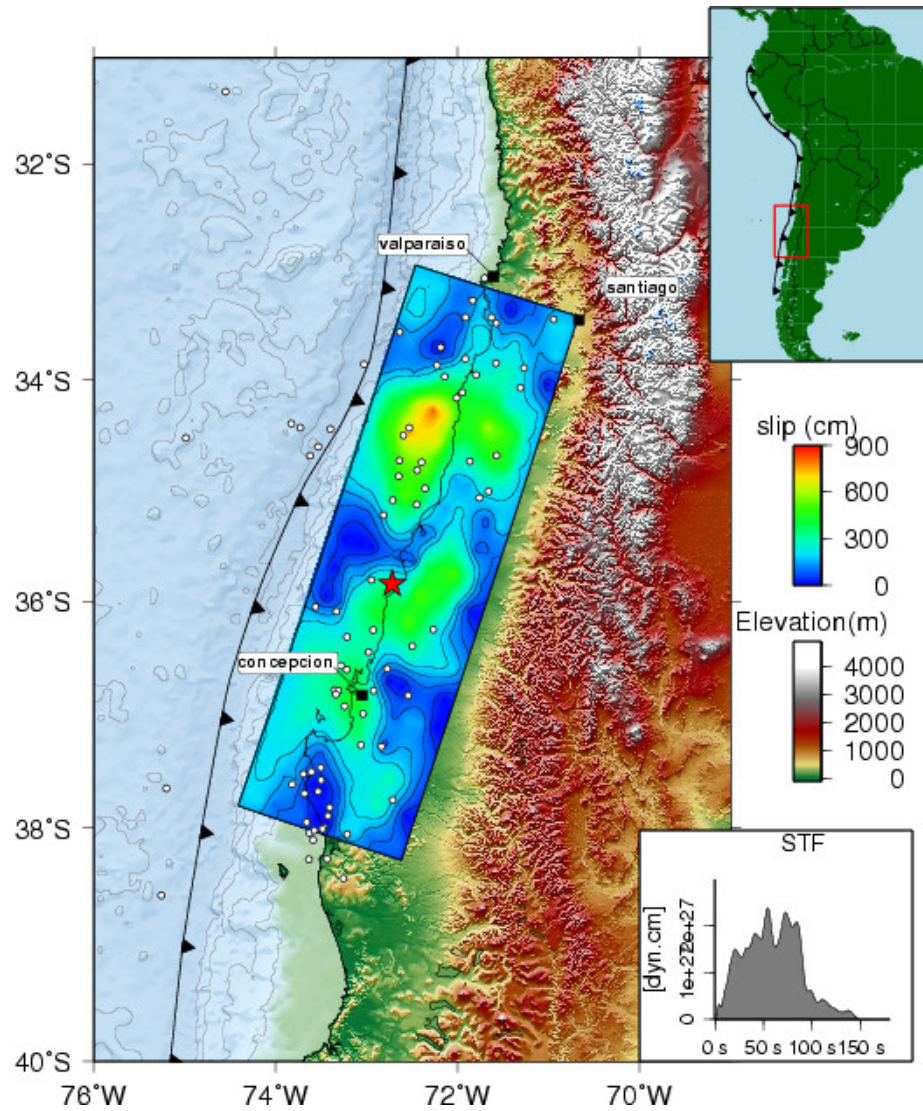


Figure 3: Surface projection of the fault plane slip distribution. The red star represents the epicenter of this event. The white dots are the aftershocks located by USGS during the day following the event.

Map view of the surface deformation

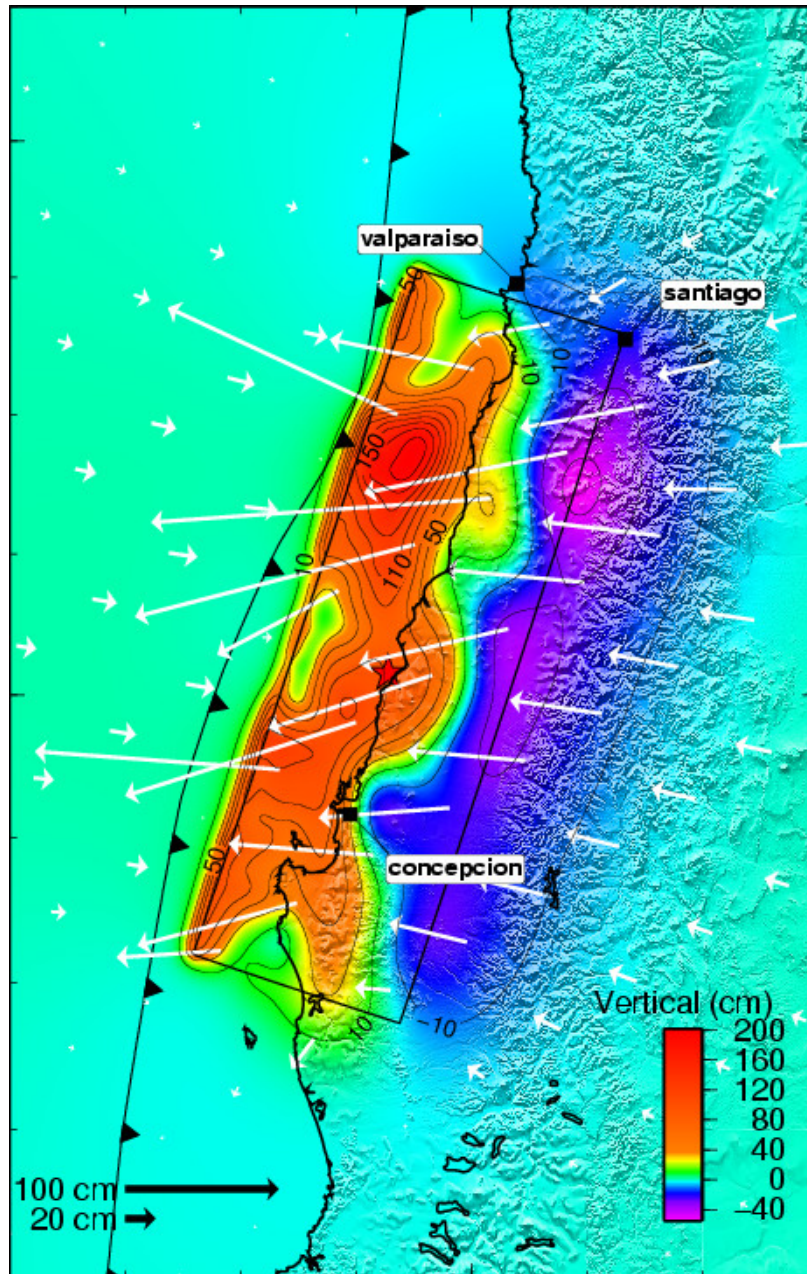


Figure 3: Surface deformation predicted from the slip model. The vertical component of displacement is given by the color scale, and the horizontal motion by the arrows.

Comments:

Download

(Slip Distribution)

[SUBFAULT FORMAT](#)

[CMTSOLUTION FORMAT](#)

[SOURCE TIME FUNCTION](#)

References

Ji, C., D.J. Wald, and D.V. Helmberger, Source description of the 1999 Hector Mine, California earthquake; Part I: Wavelet domain inversion theory and resolution analysis, Bull. Seism. Soc. Am., Vol 92, No. 4. pp. 1192-1207, 2002.

Bassin, C., Laske, G. and Masters, G., The Current Limits of Resolution for Surface Wave Tomography in North America, EOS Trans AGU, 81, F897, 2000.

GCMT project: <http://www.globalcmt.org/>

USGS National Earthquake Information Center: <http://neic.usgs.gov>

[Back to Slip Maps for Recent Large Earthquakes home page](#)