

**JPL solution for the Co- and Immediate Post-seismic displacements of
SCIGN stations in the 1999 Hector Mine Earthquake**

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The M7.1 Hector Mine earthquake ruptured the Lavic Lake fault near Twentynine Palms, CA at 09:46 UTC October 16, 1999. Because it occurred near the eastern edge of the Southern California Integrated GPS Network (SCIGN), a network of permanent, continuously recording GPS receivers for measuring the crustal deformation field around Los Angeles, CA, it was possible to determine the deformation associated with the earthquake with unprecedented speed and reliability. Thirty-four stations recorded displacements over the 3-sigma level. The displacements measured with GPS can be modeled by a fault 46.2 ± 2.6 km long, 8.2 ± 1.0 km wide, with 301 ± 36 cm right lateral strike-slip, and 145 ± 36 cm of east-up dip slip, yielding a potency of 1.3 km^3 and geodetic moment of 3.8×10^{26} dyne-cm. The trace and dip of the model fault is consistent with the observed ground rupture and seismic focal mechanisms.

A complete table of all station locations and displacements as well as time series of station positions are available from <http://milhouse.jpl.nasa.gov/hector>.

A kinematic analysis of the October 16 data from the station with the largest displacement, LDES, shows that the station moved approximately 17 cm during the main shock and 1 cm during a ML=5.6 aftershock about 13 minutes later. The position on subsequent days is indistinguishable from the position after this aftershock, indicating that any subsequent post-seismic motion at this station must be less than 2-3 mm in five days.