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# Using publicly available GPS solutions for fast estimations of first-order source details from coseismic deformations

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## Abstract

We here explore the potential use of publicly available GPS solutions to obtain first-order constraints on a source model immediately following an earthquake, within the limits of GPS solution timeliness and near-field coverage. We use GPS solutions from the Scripps Orbit and Permanent Array Center to carry out simple inversions of the coseismic displacement field induced by the 2010 Maule earthquake (Chile), by inferring the seismic moment and the rake angle of a fixed-geometry seismic source. The rake angle obtained from the inversion (m = 117.8°) is consistent with seismological estimates. The seismic moment, which corresponds to a moment magnitude MW = 8.9, is about 1.6 times greater than seismological estimates. This suggests that as in other recent megathrust events, a consistent fraction of the energy was released aseismically. In this respect, the additional information obtained from GPS can help to provide a better estimate of the weight of the aseismic contribution to the energy release.

## Keywords

GPS; Coseismic deformations; Source inversion; Maule earthquake

## Full Text:

PDF

## References

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KEYWORDS

Central Italy Earthquake GPS Historical seismology Ionosphere Irpinia earthquake Italy Mt. Etna Seismic hazard Seismic hazard assessment Seismology UN/IDNDR earthquake earthquakes historical earthquakes ionosphere magnetic anomalies paleoseismology seismic hazard seismicity seismology