

New real-time FMNEAR implementation in Chile: An advanced seismic catalogue by systematic determination of focal mechanisms, and observation of subsequent statistical seismic source parameters variations

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Chile is one of the most active seismogenic zones of the world. As for the other countries experiencing high seismic rates connected to the active convergent margin of the Nazca plate, to obtain relevant information about the seismic sources in a short time after a seismic event is of prime interest. From January 2015, the new FMNEAR seismic inversion algorithm (for determination of Focal Mechanism using NEAR-source records) is installed and running in real-time at the National Seismological Center of Chile (CSN). More than four years of data were collected, containing thousands of earthquakes, where 20% have moderate to high moment magnitudes ($MW > 4.6$). With the continuously increasing seismic network installed all along Chile, FMNEAR was able to provide more than 7,500 automatic seismic source solutions, with a mean calculation time of 5 to 10 minutes. To test the efficiency of the FMNEAR approach, we compare our solutions with the solutions provided by both USGS and GCMT catalogs (when available). Our results tested on all the inverted earthquakes common to the three methods show that the main characteristics of the source are well retrieved by the FMNEAR inversion, validating the ability of this method to work in the specific tectonic context of the active Andean subduction zone. Here, besides the presentation of the FMNEAR outcomes, we show some results on the statistical variations of source parameters in inter- and intraplate earthquakes observed thanks to this new seismic source-parameter catalog for the Chilean zone.