

Near-Field Spectra of Large Earthquakes

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© 2018, Springer Nature Switzerland AG. We have studied the spectra of large subduction earthquakes in Chile at short epicentral distances. In this work, we concentrate on the Mw 8.2, Iquique earthquake of 1 April 2014. For such a large event, in most stations we cannot separate P and S waves; which arrive very close together and interfere to produce the static displacement field. We find that the displacement spectra observed in all the accelerograms are significantly different from the usual far-field Brune spectrum. Displacement spectra have clear ω^{-1} decay at low frequencies that we prove to be associated with the dominant role of near and intermediate field waves in the ground motion. The origin of the ω^{-1} decay is that at short distances, displacement contains a finite static displacement. We confirm this spectral behavior by comparing the spectra computed from accelerograms integrated to velocity with co-located GNSS recordings. Both spectra are flat at low frequencies and