

High-Rate GNSS Detects Near-and Far-Field Distance Amplitude Scaling Effects During the 2011 Tohoku Mw9. 0 Earthquake

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Abstract: Although there are a great number of research and publications on empirical amplitude, distance and magnitude scaling laws, none of them have ever considered the near-and far-field effects of displacement functions of seismic waves. We use the GEONET GNSS data collected from the 2011 Tohoku

Mw9. 0 earthquake to resolve this inconsistency among empirical amplitude, distance and magnitude scaling laws and theoretical displacement functions. We find that high-rate dynamical GNSS PPP displacements clearly detect near-and far-field amplitude distance scaling effects in the 2011 Tohoku Mw9. 0 earthquake. However, GNSS PPP coseismic displacements decay much more rapidly than theoretically expected.

For more details, one could read the draft version of the paper via the following link:

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4944208

The revised version of the manuscript has been submitted for publication.