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Coda Calibration and Processing Tool: Java-based Freeware for the Geophysical Community

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The coda magnitude method of Mayeda and Walter (1996) provides stable source spectra and moment magnitudes (Mw) for local to regional events from as few as one station that are virtually insensitive to source and path heterogeneity. The method allows for a consistent measure of Mw over a broad range of event sizes rather than relying on empirical magnitude relationships that attempt to tie various narrowband relative magnitudes (e.g., ML, MD, mb, etc.) to absolute Mw derived from long-period waveform modeling. The Coda Calibration Tool (CCT) stems from a multi-year collaboration between the US NDC and LLNL scientists with the goal of developing a fast and easy Java-based, platform independent coda envelope calibration and processing tool. We present an overview of the tool and advantages of the method along with several calibration examples, all of which are freely available to the public via GitHub (https://github.com/LLNL/coda-calibration-tool). Once a region is calibrated, the tool can then be used in routine processing to obtain stable source spectra and associated source information (e.g., Mw, radiated seismic energy, apparent stress, corner frequency, source discrimination on event type and/or depth). We welcome future collaboration, testing and suggestions by the geophysical community.

Promotional text

CCT provides a fast and efficient means of calibrating and processing local and regional coda envelopes to estimate stable source spectra, Mw, and apparent stress, that are roughly 3-to-4 times less variable than estimates derived from traditional direct wave estimates.

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