



## **Straightforward approach for the quick characterization of earthquake magnitude and rupture length**

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With the advance and progress of Earthquake Early Warning Systems, automatic methodologies to compute the earthquake magnitude and characterize the size of the source have been developed, typically based on the analysis of the initial part of the P-wave. Recent studies revealed indeed that the event magnitude and the source duration can be automatically computed following the time evolution of the P-wave peak displacement (Pd) amplitude. The Pd vs. time curve is progressively computed by correcting Pd for the hypocentral distance and averaging over all the stations recording the event. The resulting function is a proxy for the Moment Rate Function (MRF), which is the most reliable representation of the earthquake source rupture process. Here we evaluate the proposed methodology by using a dataset of Italian earthquakes ( $3.5 \leq M \leq 6.5$ ) including accelerometric data with a maximum epicentral distance of 100 km. We analyse the time evolution of the P-wave peak displacement, velocity and acceleration amplitude (Pd, Pv and Pa, respectively) and found that our estimates of moment magnitude and source duration/length, obtained from the analysis of the initial portion of the P-wave signals are consistent with the ones obtained from the whole seismic waveform with standard techniques.