



Coseismic displacement of the 2010, Mw 7.8 Mentawai earthquake obtained from Strong Motion Data

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We recover the static displacement by double integration of strong-motion accelerometric data. A baseline correction is applied to prevent numerical instabilities in the double integration and hence unrealistic displacements. We adopted the relatively robust method of baseline correction that has been introduced by Wu and Wu (2007) which is based on the flatness idea. In order to allow analysis of the waveforms in near real-time, we modified the method to obtain the time points which indicates maximum flatness value automatically. Our modification can speed up the procedure of baseline correction and determines the flatness value from the whole trace instead of part of the trace.

We applied the technique to data of the 25 October 2010, Mw 7.8 Mentawai earthquake. The digital strong motion accelerograph network installed in Indonesia produced a large data set from this earthquake. In fact, this is the first large “tsunami earthquake” recorded by this network since it was installed after Sumatra earthquake in 2004. These data offer the opportunity to calculate the coseismic displacement of the Mentawai earthquake. For this earthquake, displacements of up to 60 cm were derived. The method appears to be stable enough to be applied in an automated fashion in near real-time. A near real-time determination of static displacement could potentially provide crucial information to assess the tsunami hazard very early after the earthquake occurrence.

Reference:

Wu YM, Wu CF (2007) Approximate recovery of coseismic deformation from Taiwan strong-motion records. *J Seismol* 11:159–170