Issues in a STA/LTA Trigger Algorithm for Strong-Motion Observations

Kunikazu Yoshida[1]; Tsutomu Sasatani[2]

[1] Active Fault Research Center, AIST, GSJ; [2] Earth and Planetary Sci., Hokkaido Univ.

We point out that sometimes a STA/LTA trigger algorithm does not work appropriately for strong-motion observations. The STA/LTA trigger algorithm evaluates the ratio of short-time average (STA) to long-time average (LTA) and is adopted to recognize an earthquake for recording by an event recorder. We observed strong-motion records in the northern part of the Ishikari plain during the 2003 Tokachi-oki earthquake and its largest aftershock. Peak ground accelerations of the records are about 1 m/s/s and peak ground velocities, about 0.3 m/s. However, two of the stations which adopted the STA/LTA trigger algorithm failed in recording during the main shock and the largest aftershock. We evaluate STA/LTA ratios by using the records obtained at other stations in order to investigate factors in not triggering these events. Weak long-period initial motion of P-wave, which was observed during the 2003 Tokachi-oki earthquake and its largest aftershock, makes the STA increase slowly. Since the LTA also increases during the slow STA increase, the STA/LTA ratios do not increase enough to trigger an event even if peak ground motion is large. We note that the STA/LTA trigger algorithm alone is not perfect for strong-motion observations, especially at an urban site.