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Earthquake-triggered tilts, up and down motions of a huge mass in the Aratozawa Landslide Area

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The 2008 Iwate-Miyagi Nairiku Earthquake induced a huge landslide at the upper reaches of Aratozawa reservoir. The movement of a huge mass that is 600m*500m in size reached to about 340m in distance. We performed aftershock observations in the Aratozawa area using broad-band strong-motion seismometers. We detected transient long-period horizontal and vertical ground motions in aftershock seismograms. The long-period horizontal and vertical ground motions are due to tilts and up/ down motions of the ground triggered by aftershocks, respectively. Site amplification characteristics for the mass show a significant peak at around 1 Hz, suggesting a resonant vibration of the mass due to the incidence of seismic waves. The results obtained in this study indicate instability of the huge mass that has experienced a large landslide.

Keywords: landslide, Aratosawa Reservoir, Iwate-Miyagi Nairiku Earthquake, seismic response, ground tilting, ground rising and descending