

Application of seismic interferometry to waveforms of small vibration recorded by the existing seismometer of a dam

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The existing seismometers installed at the dams for irrigation have recorded many seismic records during huge earthquake events. Those are useful for analysis to understand how dams behaved during earthquake. Those records are valuable as the evidence not only to show the behavior of dams caused by but also to retrieve the index to reflect the dynamic property of the dams. Considering this point, we have applied the concept of seismic interferometry and its method to seismic records of the dams to estimate their properties of seismic wave propagation and the dynamic properties of those structures.

This shows the applicability of seismic interferometry for small vibration records of existing seismometer of dams, like small earthquake records, whose maximum acceleration are less than 1cm/s^2 , or ambient noise. Based on the analysis for the waveform of acceleration during more than 10hours, we can retrieve the waveforms of time domain response similar to the one extracted from the seismic record of earthquake events, whose maximum acceleration is more than 2cm/s^2 , from small earthquake records and even from ambient noise only. This fact shows the proposed method might be applicable more frequently, if we applied it not only earthquake records but also the small records which has been considered to be trivial ones.

Though we must verify the applicability of this method to the other many dams, this method might be expected to be more useful in an area where the earthquake frequency is very small, or at a dam site where the seismometer has been installed recently and obtained little or not enough seismic records yet.

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