



SUBSURFACE ENERGY FLOW OF SEISMIC WAVES BASED ON STRONG MOTION RECORDS IN VERTICAL ARRAYS

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ABSTRACT: Seismic wave energy in surface layers is calculated based on vertical array records at 30 sites during 8 strong earthquakes recently occurred in Japan by assuming vertical propagation of SH wave. The upward energy tends to decrease generally as it goes up from the base layer to the ground surface particularly in soft soil sites due to drastic impedance changes at soil boundaries. Hence, only 30% of the upward energy reaches to the ground surface at the maximum, and about 30-40% or less tends to dissipate in the ground shallower than the deepest point with the rest 60-70% returning to the earth again, in most sites studied here. It is also found that the upward energy at the depth of around 100 m may be roughly evaluated for engineering purposes by a simple equation based on the spherical energy radiation from focal points.

Key Words: seismic wave energy, vertical array, impedance ratio, damping ratio