

RECENT FINDINGS AS DEDUCED FROM THE MICROTREMOR OBSERVATIONS
FOR ESTIMATING EARTHQUAKE DESTRUCTIONS

by

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SYNOPSIS

A new finding is obtained from the long-time observations of microtremors at some sites, having different ground conditions. Though the stability of the predominant periods obtained by the analysis of the microtremor records is well preserved in calm days, definitely longer period such as 1-2 second is predominated only at the time when the wind is blowing strongly. According to our analysis, it is explained that the predominance of such a longer period is due to the participation of the deep layers in the micro-oscillation of the ground by the strong wind excitations.

FORCIBLE OSCILLATION OF THE GROUND BY THE WIND EXCITATION
AND THE APPEARANCE OF THE MICROTREMORS ORIGINATING IN THE DEEPER LAYERS

For the purpose of examining the stability of the predominant period of the microtremors of the ground, a long-time microtremor observations were carried out at several locations. For these observations, a transducer of horizontal component having the proper oscillation period of 1 second was installed on the surface of the ground. Recording of the microtremors were made for 5 minutes at every one hour interval throughout a day, in the period from beginning April, 1973 until May, 1976. The net observations were made for about 150 days.

Noticeable change was seen on the predominant period of the microtremors only on the days when it blows hard. Aiming at the finding out the effect of the wind velocity to the excitation of microtremors, it was devised that wind velocity could be recorded side by side with the record of microtremors on the same recording paper. Main results obtained are :

- (1) Under the normal weather conditions, when there is not much wind, almost uniform predominant period is observed in the analysis of the microtremor records. In such a condition, it is observed that the preservation of the predominant period at the location is maintained fairly well in spite of the change in the intensity of the microtremors with time.
- (2) When it is blowing the strong wind, of which velocity is about 10 m/s or greater, it was observed that, in the Fourier spectrum of the microtremor, another definite peak is come out at the period which is longer than the one observed under the normal weather conditions.
- (3) Taking into considerations on the geological boring sections of the ground and the propagation velocities of S-waves of each layer at the sites, it can be calculated that the predominant periods such as 1-2 second are generated by the layers of which thickness are fairly thick.
- (4) It is concluded that stronger excitation of the ground makes to participate the deeper layers for micro-oscillation.

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