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Interactive comment on "Site effect classification based on microtremor data analysis using concentration–area fractal model" *by* A. Adib et al.

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Site effect classification based on microtremor data analysis using Concentration-area fractal model

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Abstract

The aim of this study is to classify the site effect using concentration-area (C-A) fractal model in Meybod City, Central Iran, based on microtremor data analysis. Log-log plots of the frequency, amplification and vulnerability index (k-g) indicate a multifractal nature for the parameters in the area. The results obtained from the C-A fractal modeling reveal that proper soil types are located around the central city. The results derived via the fractal modeling were utilized to improve the Nogoshi's classification results in the Meybod city. The resulted categories are: (1) hard soil and weak rock with frequency of 6.2 to 8 Hz, (2) stiff soil with frequency of about 4.9 to 6.2 Hz, (3) moderately soft soil with the frequency of 2.4 to 4.9 Hz, and (4) soft soil with the frequency lower than 2.4 Hz.

Keywords: Site effect classification, Concentration-area fractal model, Microtremor, Frequency.
Meybod city, Iran

1. Introduction

Site effect caused by an earthquake may vary significantly in a short distance. , Seismic waves trapping phenomenon leads to amplify vibrations amplitudes that may increase hazards in sites with soft soil or topographic undulations. Theoretical analysis and observational data have illustrated that each site has a specific resonance frequency at which ground motion gets amplified (Bard, 2000; Mukhopadhyay and Bormann, 2004).

Microtremor data analysis is applied in the recognition of the soil layers, prediction of shear-wave velocity of the ground, and evaluation of the predominant period of the soil during earthquake events. It

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Fig. 1. Site effect classification based on microtremor data analysis using Concentration-area fractal model