

# **Determination Site Effect of Zarqa City and Hashemite University Campus Based on Microtremors Field Measurements: A microzonation Study**

**Waleed Eid Olimat**

*Jordan Seismological Observatory (JSO)  
Ministry of Energy and Mineral Resources  
Tel: 00962791444375  
E-mail: [w.olimat@gmail.com](mailto:w.olimat@gmail.com)*

## **Abstract**

**Zarqa governorate is one of the important governorates in Jordan. It is the second populated after the capital Amman, the location of Zarqa gives the city a great importance because it lies on the main high ways leading to Syria, Iraq and Saudi Arabia, most of Jordan's industries, power plants and strategic projects are located in Zarqa, which gives this city a special importance.**

**The Nakamura's technique is applied in this study for both areas; Zarqa city and Hashemite University Campus in order to determine the resonance frequencies and amplification factors for each site then draw there maps which will be of a great use in the field of civil and structural engineering by enriching the building codes.**

**The results of our study show that; values of resonance frequency  $F$  are not affected by the time of recording. While values of amplification factor  $A$  can vary accordingly. Results also show that the amplification factor  $A$  varies from 0.8 to 8.55 in Zarqa city and varies from 0.4 to 9.36 in Hashemite University Campus, the resonance frequency ( $F$ ) also varies between 0.37 Hz and 2.98 Hz in Zarqa city and varies from 0.59 Hz to 1.77 Hz in Hashemite University Campus, that means some constructions in the study area, in case of a major earthquake, may experience minor damages respectively.**

***Keywords: Site effect, Ambient Noise, Microtremors, Resonance Frequency, Amplification Factor, Dominant frequency***