Structural dynamic characteristics assessment of ninth tour in Damascus citadel[*]

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Abstract

Damascus citadel has been affected by many historical earthquakes, which caused a considerable damage. The observed damage is concentrated in some structural elements more than others. Therefore, it is necessary to investigate the dynamic characteristics of this historical construction in order to interpret some damage cases, left by historical earthquakes such as earthquake of 1759. It is well known that, degree of damage during earthquakes strongly depends on dynamic characteristics of buildings as well as amplification of seismic waves. Because of this, first it is necessary to analyze their behaviors before reinforcing or repairing them. Since, laboratory experimentation are not suitable for historical monuments and all field works should be carried out directly on these monuments. In this study, ambient noise measurements have been chosen and preferred as being non-destructive technique and the most suitable for the study purpose. Considering this, the dynamic characteristics and response of the ninth tour in Damascus citadel are analyzed on the basis of ambient noise measurements, which have been performed on the ground and upper floor of tower. With spectral analysis of ambient noise records, predominant frequencies, amplification factors, and damping ratios have been determined

Key words: Damascus citadel, ambient noise measurements, Buildings dynamic characteristics, Syria.