

## A Study on Dynamic Characteristics of Historical Monuments in Armenia and Eastern Anatolia Using Microtremor Measurement

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Armenia and Eastern Anatolia are located on high seismicity area, where the eastern end of North Anatolian successive fault and East Anatolia Fault reaches. They are well known as high active fault. Furthermore Eurasia Plate and Arabian Plate have made collision zone in this area where is still actively deforming. Consequently huge amount of active faults have caused many disastrous earthquakes. The destructive earthquakes devastated many times, as the 1992 Erzincan earthquake and the 1988 Spitak earthquake disasters remain in the memory. Addition to it, a lot of important historical monuments, which have to be maintained from generation to generation, are built around this area. In order to conserve them, an appropriate estimation of the characteristics of buildings is required. And the investigations for the conservation must be safe, that is any survey never hurt them. The initial aim of this work is to evaluate the dynamical characteristics of the monuments using microtremors which are very low amplitude ambient motions on stationary circumstance. A microtremor measurement is one of the easiest way to evaluate it safely. The characteristic estimated in this report is the natural period, which is the most fundamental parameter for a response analysis. It is important to measure actual buildings and to grasp the tendency statistically. Because the construction type which have double walls with rubble core is the old fashion structure and is not applied for the buildings these days, even if masonry structures. The previous researches and the actual measurements data for such kind of structure are few. We are considering that our results produces basic comparable material to apply similar kind of old fashioned buildings.

The natural period of historical monuments can be evaluated between 0.12 second and 0.59 second using microtremor measurements. We examined that the natural periods of damaged monuments are relatively long. For the repair, it is reasonable to undertake first the monuments of which natural period is long comparing to similar kind of structure. In the near future, an estimation of earthquake motions provided by Turkish seismic network and with catalog of the historical earthquake and data of surface geology will be performed to investigate the vulnerability of such kind of structures.

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