عنوان مقاله:

Evaluation of Frequency Response Functions of Structural System under Various Base Conditions

محل انتشار:

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خلاصه مقاله:

Forced vibration test and seismic wave observations are commonly used to determine the modal parameters of the actual structures from system identification analysis. In practice and for usual structures, the effect of the soil-structure interaction is neglected and the fixed-base modal parameters, which reflect the dynamic characteristics of the structure alone, are assumed to be nearly equal to those of the flexible base one. The common result is that the natural frequency of the building is underestimated and the damping ratio is overestimated. The objective of any system identification analysis is to evaluate the unknown system having the input-output data. The system can be described as impulse response function (in time domain) or frequency response function (in frequency domain). The purpose of this study is to evaluate the frequency response functions of the structural system under various base conditions for forced vibration analysis using the recorded data of the system. The method to evaluate these frequency response functions is derived and its applicability is shown. The frequency response functions for three various base conditions; namely the fixed-base, flexible base and pseudo-flexible base are analytically obtained subjected to a unit input ground motion to the target models. Then the proposed method to identify the frequency response functions is applied and the results are compared with those of the targets. It is shown that the obtained .frequency response functions are identical to the target ones

کلمات کلیدی:

Frequency response function, System identification analysis, Soil-structure interaction, Response analysis