

NOISE-BIAS COMPENSATION METHOD FOR SYSTEM IDENTIFICATION OF BUILDING STRUCTURES USING SMALL-AMPLITUDE STATIONARY RANDOM INPUT

A physical-parameter system identification method was proposed in a previous paper which enables one to eliminate the noise effects in the case of containing a noise at either one of floors just above or below a specified story. In order to examine the effect of the level and correlation of noises on the identification accuracy, a new frequency-domain simulation method is proposed for generating two stationary random processes with a specified level and correlation. It is shown that, when the previous system identification method is applied to the case including noises at both floors, the method fails to evaluate the true stiffness and damping coefficients depending on the level and correlation of noises. To resolve this problem, a new noise-bias compensation method is proposed which enables the evaluation of the level and correlation of noises before identifying the story stiffness and damping.