

9. Evaluating the Vibration Characteristics of a Five-Storied Pagoda

Susumu Hirano, Satoshi Yamagami, Kunihiro Nakajima, Takatoshi Yoshida

The five-storied pagoda is a traditional wooden structure generally believed to have excellent earthquake resistance properties. However, virtually no studies have quantitatively observed and verified the vibration characteristics of actual pagodas during earthquakes.

In this study, to better grasp the dynamic characteristics of a five-storied pagoda, we undertook continuous microtremor observations, free vibration tests, and seismic response observations of the Taisekiji five-storied pagoda at Fujinomiya-shi in Shizuoka Prefecture. We also created an analytical model of the shear-type lumped mass model and attempted to simulate building response in the event of an earthquake. This report describes the dynamic characteristics of a five-storied pagoda identified in the seismic observations. It also discusses the validity of the modeling used in simulation analysis of building response during earthquakes and future challenges.

Key words: Important Cultural Properties (buildings), five-storied pagoda, seismic observation, earthquake response analysis, simulation