ABSTRACT

Diponegoro University is located within the Kaligetas Formation, which consists of volcanic breccia, tuff, tuffaceous sandstone, and claystone. Variations in these geological materials may influence local seismic response characteristics. This study aims to identify local seismic response characteristics and evaluate the level of seismic vulnerability in the Diponegoro University area using Horizontal to Vertical Spectral Ratio (HVSR), shear-wave velocity to a depth of 30 m (Vs_{30}), seismic vulnerability index (K_g), Peak Ground Acceleration (PGA), and Ground Shear Strain (GSS). Microtremor data were collected from 98 measurement points using the Indonesian Seismograph (SRI). HVSR analysis was carried out using Geopsy, while Vs_{30} values were estimated through H/V curve inversion using Dinver. The K_g, PGA, and GSS parameters were calculated from the processed HVSR results. The analysis indicates that dominant frequency (f_0) values range from 1.317 to 14.468 Hz, amplification factors (A_0) range from 0.87 to 7.08, and Vs_{30} values range from 578.51 to 1678.03 m/s. According to SNI 1726:2019, most of the study area is classified as Site Class SB. The K_g values range from 0.1 to more than 4, while PGA values range from 2.6 to 8.2 gal, corresponding to intensity levels III–IV on the Modified Mercalli Intensity (MMI) scale. GSS values range from 7.8×10^{-4} to 3.15×10^{-2}. Overall, the study area exhibits low to moderate seismic vulnerability, although several locations show a greater potential for soil deformation than surrounding areas.

Keywords : HVSR, microtremor, seismic vulnerability, site classification, ground shear strain, Diponegoro University