ABSTRACT

This study develops an initial Ground Motion to Intensity Conversion Equation (GMICE) for the coastal area of Semarang City, particularly within the alluvial deposits, by integrating dominant frequency data obtained from microtremor surveys with theoretical Peak Ground Acceleration (PGA) estimates derived from the Kanai equation. A total of 6.213 data points from 57 earthquake events occurring between 2019 and 2024 were analyzed using both simple and complex regression models. The simple GMICE model is defined as a function of the logarithmic PGA, whereas the complex model incorporates additional parameters including moment magnitude (Mw) and epicentral distance (R). These models yielded coefficients of determination (R^2) of 0,9922 and 0,7935, respectively. The findings indicate that the resulting GMICE models adequately represent the distribution of seismic intensity across the study area, which is predominantly composed of alluvial sediments. Although the number of earthquake events used in this study is relatively limited, the research provides an important preliminary foundation for developing region-specific GMICE models in Indonesia. The resulting GMICE formulations are $MMI = 0{,}97 + 2{,}24\ log(PGA)$ *for simple model and* $MMI = 54{,}7657 + 1{,}5984\ log(PGA) + 0{,}0444\ Mw - 27{,}4245\ log(R + 10) + 0{,}0949R$ *for complex model.*

Keywords : ground motion to intensity conversion equation, peak ground acceleration, dominan frequency, seismic intensity