ABSTRAK

Potensi Indonesia terkena dampak dari gempa sangatlah besar. Gempa bumi identik dengan goncangan. Goncangan tersebut terjadi akibat pelepasan energi yang terjadi di dalam kerak bumi. Besarnya intensitas goyangan sangat berpengaruh terhadap tingkat kerusakan yang terjadi pada bangunan yang berada di atas permukaan tanah. Penelitian ini bertujuan untuk mengetahui hubungan antara magnitudo, jarak episentrum, terhadap intensitas dan hubungan antara magnitudo, jarak episentrum, terhadap PGA. Data gempa yang digunakan memiliki magnitudo sebesar 4,1 – 9,0. Data tersebut berupa lokasi episentrum (sou*rce latitude, source longitude, sitelat,* dan *sitelon*), waktu kejadian, tempat kejadian, nama stasiun, magnitudo, intensitas, dan *Peak Ground Acceleration* (PGA) yang didapatkan dari stasiun gempa. Data tersebut didapatkan dari website bernama www.kyoshin.bosai.go.jp. Data gempa tersebut dikumpulkan dari berbagai wilayah di Jepang sejak tahun 1996. Data yang didapatkan sebanyak 126.480 data. Hasil dari penelitian ini menunjukkan bahwa garis batas pada grafik hubungan antara magnitudo serta jarak episentrum terhadap intensitas serta hubungan antara magnitudo serta jarak episentrum terhadap PGA menghasilkan persamaan berupa logaritma natural (ln). Persamaan tersebut memiliki bentuk umum seperti: $y = a \ln(x) + b$. Persamaan tersebut menunjukkan bahwa nilai a merupakan koefisien yang mengatur kecepatan penurunan intensitas serta PGA dan nilai b merupakan konstanta yang mengontrol nilai intensitas serta PGA.

Kata Kunci : gempa bumi, jarak episentrum, magnitudo, intensitas, *peak ground acceleration*

ABSTRACT

The potential of Indonesia being affected by an earthquake is huge. Earthquakes are synonymous with shaking. The shaking occurs due to the release of energy that occurs in the earth's crust. The strength of the shaking intensity greatly affects the level of damage that occurs to buildings above the ground. This study aims to determine the relationship between magnitude, epicenter distance, and intensity and the relationship between magnitude, epicenter distance, and PGA. The earthquake data used has a magnitude of 4.1 - 9.0. The data is in the form of epicenter location (source latitude, source longitude, site, and siteelon), event time, event place, station name, magnitude, intensity, and Peak Ground Acceleration (PGA) which are obtained from the earthquake station. The data was obtained from a website called www.kyoshin.bosai.go.jp. The earthquake data was collected from many regions in Japan since 1996. The data obtained were 126,480 data. The results of this study show that the boundary line on the graph of the relationship between magnitude and epicenter distance to intensity and the relationship between magnitude and epicenter distance to PGA produces an equation in the form of natural logarithm (ln). The equation has the general form: $y = a \ln \llbracket f_0 \rrbracket \ \llbracket (x) \rrbracket + b$. The equation shows that the value of a is a coefficient that controls the speed of intensity decrease and PGA, and the value of b is a constant that controls the value of intensity and PGA.

Keywords : earthquake, epicenter distance, magnitude, intensity, peak ground acceleration