

INTISARI

ANALISIS PEAK GROUND ACCELERATION BERDASARKAN MODEL EMPIRIS UNTUK DAERAH PADANG, SUMATRA BARAT

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Analisis *peak ground acceleration* telah dilakukan di Padang dan sekitarnya dengan batas wilayah $0,54^{\circ}$ - $1,76^{\circ}$ LS dan $99,27^{\circ}$ - $100,8^{\circ}$ BT. Data penelitian yang digunakan bersumber dari BMKG (Badan Meteorologi Klimatologi dan Geofisika) yaitu data pengukuran mikrotremor di kota Padang yang telah disurvei pada Juli hingga Agustus 2011, data relokasi gempabumi dan data *accelerograph* (*observation data*) periode tahun 2009 - 2015. Penelitian ini dilakukan untuk merumuskan model empiris baru, mengetahui estimasi nilai dan persebaran *peak ground acceleration* menggunakan model empiris baru dan tiga model empiris lain yaitu model McGuire, model Fukushima dan Tanaka, dan model Kanai serta validasi model-model tersebut dengan data *accelerograph*.

Hasil penelitian yang diperoleh yaitu tiga model empiris baru untuk interval magnitudo gempa 3,1-7,6 SR. Estimasi nilai *peak ground acceleration* daerah Padang yang dihasilkan dari model-model empiris sangat bervariasi untuk setiap *event* gempa. Model empiris baru menunjukkan estimasi nilai sekitar 1,12-63 gal, model Fukushima dan Tanaka menunjukkan estimasi nilai sekitar 6,3-316,2 gal, model McGuire menunjukkan estimasi nilai sekitar 15,8-199 gal, dan model Kanai menunjukkan estimasi nilai sekitar 4,46-126 gal. Dengan perbandingan *peak ground acceleration* diperoleh hasil estimasi nilai pada model Kanai dan model empiris baru lebih mendekati nilai *peak ground acceleration* pada 32 stasiun *accelerograph*. Hal tersebut diperkirakan karena model Kanai menggunakan nilai periode dominan dimana nilai tersebut merepresentasikan faktor *site* (kondisi daerah setempat) dan model empiris baru yang merupakan model yang berasal dari data *accelerograph* sehingga hasil yang diperoleh tidak jauh berbeda. Sedangkan estimasi nilai untuk model Fukushima dan Tanaka, dan model McGuire adalah lebih tinggi daripada *accelerograph*.

Kata kunci : *Peak ground acceleration*, Model-model empiris, *Accelerograph*

ABSTRACT

ANALYSIS OF PEAK GROUND ACCELERATION BASED ON EMPIRICAL MODEL IN PADANG, WEST SUMATRA

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Analysis of peak ground acceleration was performed in Padang and surrounding areas by boundaries of 0.54° - 1.76° LS and 99.27° - 100.8° BT. The research data were obtained from BMKG (*Badan Meteorologi Klimatologi dan Geofisika*). The microtremor data were measured in Padang from July to August 2011. The earthquake relocation and accelerograph data were obtained from observation from 2009 to 2015. This study aims to formulate a new empirical model, estimating the value and the spread of peak ground acceleration using the new model and three other models, i.e., McGuire model, Fukushima and Tanaka model, and Kanai model as well as validation of these models by using accelerograph data.

The study resulted in three new empirical models with magnitude interval from 3.1 to 7.6 SR. Estimated values of peak ground acceleration in Padang, West Sumatra were resulted from variety of empirical models for every earthquake event. New empirical models show estimated values from 1.12 to 63 gal, Fukushima and Tanaka model shows estimated values from 6.3 to 316.2 gal. Additionally, McGuire model shows estimated values from 15.8 to 199 gal, and Kanai model shows estimated values from 4.46 to 126 gal. By comparing peak ground acceleration maps, it was found that estimated values from Kanai model and new model were close to the values of peak ground acceleration generated from 32 accelerograph stations. These results had been predicted because Kanai model was using dominant period value which representing the site factor. The new empirical model in this study was a model based on accelerograph data, so the results of the new empirical model and the accelerograph model may not differ. The estimated value of peak ground acceleration for Fukushima and Tanaka model, and McGuire model were higher than accelerograph's.

Keywords: Peak ground acceleration, Empirical models, Accelerograph