ABSTRAK

KARAKTERISASI DATA MIKROSEISMIK BERDASARKAN ANALISIS KURVA HVSR, *PARTICLE MOTION*, DAN *TIME FREQUENCY ANALYSIS* PADA KAWASAN JALUR SESAR OPAK

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Gempa bumi yang terjadi di wilayah D.I Yogyakarta terjadi akibat aktifitas sesar yang terdapat dipermukaan, seperti Sesar Opak-Oyo, Sesar Dengkeng dan Sesar yang terdapat di Perbukitan Menoreh serta aktifitas lempeng tektonik yang terdapat di Selatan Pulau Jawa. Aktifitas Sesar Opak-Oyo dapat tercermin dari distribusi episenter dan energi gempabumi yang terjadi. Dalam identifikasi aktivitas sesar opak tersebut menggunakan metode Mikroseismik. Metode ini mengukur getaran alami maupun buatan.

Tujuan dari penelitian ini adalah mengetahui karakteristik Mikroseismik berdasarkan analisa kurva HVSR, *Particle Motion* dan *Tiime Frequency Analysis* di kawasan jalur Sesar Opak. Data penelitian ini diambil menggunakan seismometer tipe Le 3D/5S. Data yang diambil berjumlah 16 Titik dengan kondisi titik menyebar diarea Sesar Opak.

Hasil penelitian ini menunjukkan bahwa karakteristik Mikroseismik berdasarkan analisis kurva HVSR (*Horizontal to Vertical Spectral Ratio*), *particle motion*, maupun *Time Frequency Analysis* (TFA). Berdasarkan analisis nilai frekuensi dominan (f0), terdapat dua zona karakter yaitu zona I yang bernilai rendah dengan rentang nilai 2,25 – 3 Hz dan zona II yang bernilai tinggi dengan rentang nilai 6 – 7,5 Hz, berdasarkan metode *galitzin* pada area penelitian menunjukkan karakter pola orientasi arah getaran Barat Laut-Tenggara (NW-SE) yang tegak lurus terhadap arah kemenerusan sesar opak, dan berdasarkan analisis *Time Frequency Analysis* (TFA) terdapat kontinuitas amplitudo di daerah yang cukup rawan dengan nilai amplitudo 0,2 - 0,4 Magnitudo dengan rentang frekuensi 4-5 Hz pada komponen Z (Vertikal)

Kata Kunci: HVSR, *Particle Motion, Time Frequency Analysis*, Karakteristik Mikroseismik, Sesar Opak.

ABSTRACT

CHARACTERIZATION OF MICROSEISMIC DATA BASED ON HVSR CURVE ANALYSIS, PARTICLE MOTION, AND TIME FREQUENCY ANALYSIS IN OPAK FAULT ROUTE AREA

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The earthquake around in the D.I Yogyakarta region is dominatly caused by fault activities on the surface, such as the Opak-Oyo Fault, Dengkeng Fault and Fault in the Menoreh Hills and tectonic plate activity in the southern part megathrust. The seismicity can br reflected from the epicenter and hypocenter distribution, and to get the description ot the vulnerability it can be know from hhe activity of the Opak-Oyo fault. The identification of the opak- Oyo fault activity using the Microseismic method. This method measures both natural and artificial vibrations.

The purpose of this research is to determine the characteristics of microtremor based on the analysis of the HVSR curve, Particle Motion and Tiime Frequency Analysis in the Opak Fault area. The data for this study is taken using a Le 3D/5S seismometer. The are 16 points data a long Opak- Oyo fault area.

The results of this research indicate that the characteristics of microtremor are based on the analysis of the HVSR (Horizontal to Vertical Spectral Ratio) curve, particle motion, and Time Frequency Analysis (TFA). Based on the analysis of the dominant frequency value (f0), there are two kind, namely zone I which has a low value with a value range from 2.25 to 3 Hz and zone II which has a high value with a value range from 6 to 7.5 Hz, based on Galitzin method shows the character of the orientation pattern of the Northwest-Southeast (NW-SE) vibration direction that is perpendicular to the direction of the opak fault continuity, and based on Time Frequency Analysis (TFA) analysis there is an amplitude continuity in a fairly vulnerable area with an amplitude value from 0.2 to 0 ,4 Magnitudo with a frequency range of 4-5 Hz on the Z component (Vertical)

Kata Kunci: *HVSR, Particle Motion, Time Frequency Analysis, Characteristics of microtremor, Opak Fault*.