

## INTISARI

### KARAKTERISASI SINYAL SEISMIK DI BLEDUG KUWU, GROBOGAN, JAWA TENGAH MENGGUNAKAN KRITERIA *TIME-FREQUENCY* *MISFIT* DAN *GOODNESS-OF-FIT*

Oleh :

SITTI RUGAYYA  
12/340091/PPA/04044

Telah dilakukan penelitian tentang analisis sinyal seismik semburan gunung lumpur Bledug Kuwu untuk karakterisasi sinyal seismik berdasarkan rekaman seismometer dan video secara kuantitatif.

Data sinyal seismik dan rekaman video diukur masing-masing menggunakan seismometer dan “camcorder” yang diletakan pada jarak 120 m dari sumber letupan. Karakterisasi sinyal seismik semburan lumpur digunakan untuk memperoleh tipe sinyal referensi semburan lumpur dengan cara mencocokkan waktu tiba sinyal *event* semburan dengan waktu pada rekaman video. Sinyal referensi dan sinyal *event* dianalisis secara kuantitatif menggunakan kriteria *Time-Frequency misfit* dan *goodness-of-fit*.

Berdasarkan hasil karakterisasi sinyal seismik diperoleh 4 tipe sinyal referensi semburan lumpur Bledug Kuwu dengan bentuk letupan yang berbeda-beda yaitu tipe A menyemburkan satu gelembung letupan, tipe B menyemburkan dua gelembung letupan pada waktu yang sama, tipe C menyemburkan lebih dari dua gelembung letupan, dan tipe D menyemburkan gelembung letupan yang besar. Hasil perbandingan kuantitatif antara sinyal referensi dan sinyal seismik menggunakan kriteria *time-frequency misfit* dan *goodness-of-fit* menghasilkan tingkat kecocokan yang paling tinggi dengan nilai *Envelope Misfit* (EM) kurang dari 0,50 dan nilai *Phase Misfit* (PM) kurang dari 0,30 serta nilai *Envelope Goodness-of-Fit* (EG) besar dari 6,00 dan nilai *Phase Goodness-of-Fit* (PG) besar dari 7,00.

**Kata Kunci:** Bledug Kuwu, sinyal seismik, sinyal referensi, sinyal *event*, *Time-Frequency misfit* dan *goodness-of-fit*.

## ABSTRACT

### CHARACTERIZATION OF SEISMIC SIGNALS AT BLEDUG KUWU, GROBOGAN, CENTRAL JAVA USING TIME-FREQUENCY MISFIT AND GOODNESS-OF-FIT CRITERIA

By :

SITTI RUGAYYA  
12/340091/PPA/04044

This study has been done about seismic signal analysis of the Mud volcano eruption at Bledug Kuwu for characterization of seismic signals based on seismometer and video recording quantitatively.

Seismic signal data and video recordings were measured respectively using seismometers and "camcorder" at a distance of 120 m from the eruption source. Characterization of seismic signals where used to obtain the type of reference signal from the mud eruption by matching the arrival time of eruption event signal with the time of video recording. The Reference and event signals analyzed quantitatively using Time-Frequency misfit criteria and goodness-of-fit.

Based on the results of the seismic signals characterization, obtained four types Bledug Kuwu's reference signals with various eruption. There were A types given off one bubble, B types given off two bubbles at the same time, C types given off more than two bubbles, and D types given off big bubble of eruption. The results of a comparative analysis between the seismic signals and the reference signals using time-frequency misfit and goodness-of-fit obtained that the highest level of compatibility with Envelope Misfit (EM) value less than 0,50 and Phase Misfit (PM) value less than 0,30, and Envelope Goodness-of-Fit (EG) value greater than 6,00 and Phase Goodness-of-Fit (PG) greater than 7,00.

**Key Words:** Bledug Kuwu, seismic signals, reference signals, event signals, Time-Frequency misfit and goodness-of-fit.