

# Dengkeng Fault Line Identification in Klaten Regency Using Geophysical Methods

by Denny Darmawan, Bambang Ruwanto, Laila Katriani, Khafid Nur Aziz, M. Ilham Nurdhi Hafsyah dan Fitri Fajarningrum

## ABSTRACT

Research at Dengkeng Fault line area had been conducted. This research was aimed to (1) determine the microzonation of microtremor parameters around Dengkeng Fault line, (2) identify the Dengkeng Fault line in Klaten Regency based on microtremor analysis, (3) identify the Dengkeng Fault line in Klaten Regency based on gravity analysis. This research used two geophysical methods, which are microseismic method based on microtremor analysis obtained from field measurement and gravity method based on gravity data obtained from satellite measurement. For microtremor measurement, it used around 48 measurement points with interval of 2 km. Measurement was conducted for 30 minutes for each point with sampling frequency of 100 Hz. The signals then were analyzed using HVSZ (*Horizontal to Vertical Spectral Ratio*) method to get the predominant frequency and amplification value. From both parameters, the distributions were analyzed and were used in identifying the Dengkeng Fault line. For gravity analysis, data from GGMplus were used with free-air and complete Bouguer correction and also second vertical derivative (SVD) analysis to identify the fault line. Research results showed that distribution of predominant frequency has good agreement with geological setting in the research area and the distribution of amplification factor showed higher value along the fault line. Directional amplification distribution and H/V cross section showed that the Dengkeng Fault line is striking East-West and located in the geological formation boundary between Gunungapi Merapi Muda formation and Kebobutak formation. SVD analysis results showed that the fault line is a normal fault with the north side of the fault is the hanging wall and is subsiding.

Kata Kunci: *Dengkeng Fault, Microtremor, HVSZ method*