

## **ABSTRACT**

*Indonesia is a country rich in historical and cultural heritage that is still largely buried in various regions, such as temples, statues, and ancient building structures, so proper method is needed to detect it without changing the ground conditions. One method that can be used is microtremor, a passive geophysical method that utilizes natural environmental vibrations to determine subsurface characteristics. This study aims to analyse the spectral response of microtremor using the HVSR method in detecting buried object models. There are two buried anomalous object models, namely the first anomalous object arranged vertically, and the second anomalous object arranged horizontally. The first anomalous object is 70 cm from the ground surface, and second anomalous object is 55 cm from the ground surface. Data collection was conducted at 49 measurement points on each buried object with 20 cm between points and a recording duration of approximately  $\pm 5$  minutes using a three-component sensor (X, Y, and Z). The obtained data were then processed using Fast Fourier Transform (FFT) and geopsy software to generate the HVSR curve, resulting in the dominant frequency value ( $f_0$ ) and amplification ( $A_0$ ), which were then visualized in contour form using surfer software. The results showed that the first anomalous object had a dominant frequency value in the range of 0.20 Hz to 8.89 Hz with amplification values of 2.02 to 3.30, while the second anomalous had a dominant frequency value in the range of 0.18 to 8.79 Hz and amplification values in the range of 1.76 to 10.14. The relatively similar dominant frequency ranges in both anomalous objects indicate that the subsurface conditions and depths of the objects are not much different. Significant differences in amplification values indicate differences in the characteristics of buried anomalous patterns and can be used to interpret subsurface conditions.*

**Keywords :** *microtremor, HVSR, dominant frequency, amplification, buried object.*