

ABSTRACT

This study aims to evaluate the influence of the number of geophones in array configurations on the quality of surface wave dispersion curves using the Frequency–Wavenumber (F-K) method. Measurements were conducted at the roadside of Burangrang Utara IV Street, Tembalang District, Semarang City, with geophone number variations ranging from 3, 5, 7, and 9 points. Microtremor data acquisition was performed for 10 minutes at each measurement point. The analysis results indicated that increasing the number of geophones significantly enhances the continuity, stability, and smoothness of dispersion curves on both measurement lines. Quantitative evaluation using the Root Mean Square Error (RMSE) showed the lowest values at the 9-point configuration, namely 0,3675 on the first track and 0,6475 on the second track, indicating the best conformity to the average curve. The 3 point configuration produced the highest RMSE with significant deviation. These results demonstrate that increasing sensor numbers improves spatial resolution, enabling more representative and consistent dispersion curve extraction concerning subsurface conditions. This study emphasizes the importance of optimal array configuration in microtremor surface wave analysis using the F-K method.

Keywords : *Dispersion curve, F-K, microtremor, number of geophone*