Emerging Trends in Applied Mathematics and Mechanics (ETAMM)
September 02-04, 2026. Lodz, Poland

Surface Wave Vıbratıon ın FGPM Composıte Structure: Asymptotic Approximation

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Abstract:

This paper aims to study the surface wave vibration in a functionally graded piezoelectric plate resting over a homogeneous elastic substrate. The material properties of the piezoelectric plate are assumed as a linear function of depth. WKB Asymptotic approximation method is used to solve the coupled electro-mechanical field equations. Using proper boundary conditions, the dispersion relations are obtained for both electrically open and short circuit cases. By using a particular example, graphical demonstrations are given for phase velocity which expatiate the influence of functional grading and other relevant parameters on the dispersion of wave. The salient outcomes may be utilized as guidelines for the theoretical study of optimization of the performance of surface acoustic wave devices.

Keywords: piezoelectric plate, functionally grading, aysmptotic approximation, WKB method

2010 Mathematics Subject Classification: 74J05, 74J15, 74J40, 74E30

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