Cross-talking Of PZT Elements Within A Sonar Transducer

Adnan Eghtesad[1], Diptojit Datta[2], Daniel Mennitt[2], Steve Kreuzer[2], Paul Briant [2]

[1]Exponent
[2]

Abstract

Finite Element Analysis (FEA) of cross-talking behavior for an array of Piezoelectric (PZT) elements within a sonar transducer was performed. First, the resonance and anti-resonance behavior was verified with analytical solutions for a slender beam fixed at one end. Second, the verified FEA framework within COMSOL Multiphysics was deployed to study the impedance response of neighboring elements under excitation of the source element. Results revealed promising capabilities of COMSOL Multiphysics in capturing the coupled electrostatic-mechanical behavior of PZT materials and the particularities pertaining to the cross-talking phenomena.

Figures used in the abstract

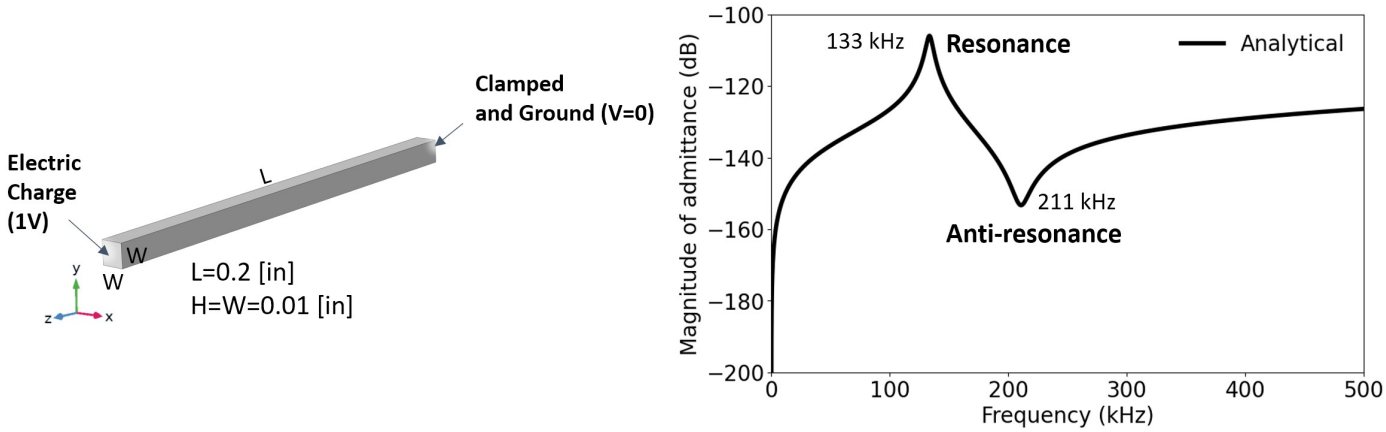

Figure 1 : Admittance Spectrum of PZT Slender Bar