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Sommario/riassunto

"Vibrations of Linear Piezostructures is a self-contained and introductory text providing a focused and concise account of the general theory of vibrations of linear piezostructures. While piezoelectric materials and sensors have been studied for decades, a person seeking a general introduction to the theory for modeling and analysis of this emerging class of sensors, actuators, and active systems currently must assimilate approaches from older outdated texts, journal or conference articles, edited volumes, highly specialized texts, or manuscripts that primarily treat other topics such as crystallography, tensor mathematics, continuum mechanics, or continuum electrodynamics. The book deals with the fundamental principals, starting with a review of mathematics, continuum mechanics and elasticity, and continuum electrodynamics as they are applied to electromechanical piezostructures. It continues by developing the work related to linear constitutive laws of piezoelectricity. Following this, it addresses modeling of linear piezostructures via Newton's approach and consequently via Variational Methods. And in the end it presents a general discussion of weak and strong forms of the equations of motion, Galerkin approximation methods for the weak form, Fourier or modal methods, and finite element methods."--