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Sommario/riassunto

This book describes an effective method for modeling advanced materials like polymers, composite materials and biomaterials, which are, as a rule, inhomogeneous. The thermoelastic theory with internal variables presented here provides a general framework for predicting a material's reaction to external loading. The basic physical principles provide the primary theoretical information, including the evolution equations of the internal variables. The cornerstones of this framework are the material representation of continuum mechanics, a weak nonlocality, a non-zero extra entropy flux, and a consecutive employment of the dissipation inequality. Examples of thermoelastic phenomena are provided, accompanied by detailed procedures demonstrating how to simulate them.