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Nota di contenuto	Multiscale Modeling of Heterogenous Materials; Table of Contents; Foreword; Chapter 1. Accounting for Plastic Strain Heterogenities in Modeling Polycrystalline Plasticity: Microstructure-based Multi-laminate Approaches; 1.1. Introduction; 1.2. Polycrystal morphology in terms of grain and sub-grain boundaries; 1.2.1. Some evidence of piece-wise regularity for grain boundaries; 1.2.2. Characteristics of plastic-strain due to sub-grain boundaries; 1.3. Sub-boundaries and multi-laminate structure for heterogenous plasticity 1.3.1. Effective moduli tensor and Green operator of multi-laminate structures1.3.2. Multi-laminate structures and piece-wise homogenous plasticity; 1.4. Application to polycrystal plasticity within the affine approximation; 1.4.1. Constitutive relations; 1.4.2. Fundamental properties for multi-laminate modeling of plasticity; 1.5. Conclusion; 1.6. Bibliography; Chapter 2. Discrete Dislocation Dynamics: Principles and Recent Applications; 2.1. Discrete Dislocation Dynamics as a link in multiscale modeling; 2.2. Principle of Discrete Dislocation Dynamics 2.3. Example of scale transition: from DD to Continuum Mechanics2.3.1. Introduction to a dislocation density model; 2.3.1.1. Constitutive

Sommario/riassunto

A material's various proprieties is based on its microscopic and nanoscale structures. This book provides an overview of recent advances in computational methods for linking phenomena in systems that span large ranges of time and spatial scales. Particular attention is given to predicting macroscopic properties based on subscale behaviors. Given the book's extensive coverage of multi-scale methods for modeling both metallic and geologic materials, it will be an invaluable reading for graduate students, scientists, and practitioners alike.