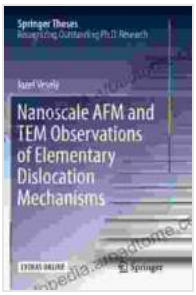
Nanoscale AFM and TEM Observations of Elementary Dislocation Mechanisms



Nanoscale AFM and TEM Observations of Elementary Dislocation Mechanisms (Springer Theses)

★★★★★ 5 out of 5

Language	: English
File size	: 10342 KB
Text-to-Speech	: Enabled
Screen Reader	: Supported
Enhanced typesetting	: Enabled
Print length	: 114 pages

Dislocations are line defects in crystals that play a critical role in the mechanical properties of materials. They are responsible for пластическая деформация and fracture, and they can also affect the electrical, thermal, and optical properties of materials.

The study of dislocations has a long history, dating back to the early days of microscopy. However, it was not until the development of nanoscale AFM and TEM techniques in the late 20th century that it became possible to observe dislocations at the atomic level.

Nanoscale AFM and TEM techniques have revolutionized the study of dislocations. They have allowed researchers to observe dislocations in unprecedented detail, and they have provided new insights into the mechanisms by which dislocations move and interact with each other.

This book presents a comprehensive overview of the latest advances in nanoscale AFM and TEM techniques for the study of elementary dislocation mechanisms in materials. It covers a wide range of topics, including:

* The fundamentals of nanoscale AFM and TEM techniques * The observation of dislocations at the atomic level * The mechanisms of dislocation motion and interaction * The role of dislocations in plastic deformation and fracture * The applications of nanoscale AFM and TEM techniques in materials science

This book is a valuable resource for researchers in materials science, mechanics of materials, and other related fields. It provides a comprehensive overview of the latest advances in nanoscale AFM and TEM techniques, and it offers new insights into the mechanisms by which dislocations move and interact with each other.

Chapter 1: Fundamentals of Nanoscale AFM and TEM Techniques

This chapter provides an overview of the fundamentals of nanoscale AFM and TEM techniques. It covers the following topics:

* The principles of AFM and TEM * The different types of AFM and TEM microscopes * The preparation of samples for AFM and TEM * The imaging of dislocations with AFM and TEM

Chapter 2: The Observation of Dislocations at the Atomic Level

This chapter presents a detailed overview of the observation of dislocations at the atomic level using nanoscale AFM and TEM techniques. It covers the following topics:

* The different types of dislocations * The atomic structure of dislocations * The imaging of dislocations with AFM and TEM * The analysis of dislocation images

Chapter 3: The Mechanisms of Dislocation Motion and Interaction

This chapter discusses the mechanisms by which dislocations move and interact with each other. It covers the following topics:

* The different types of dislocation motion * The mechanisms of dislocation interaction * The role of dislocations in plastic deformation and fracture

Chapter 4: The Applications of Nanoscale AFM and TEM Techniques in Materials Science

This chapter presents a variety of applications of nanoscale AFM and TEM techniques in materials science. It covers the following topics:

* The use of nanoscale AFM and TEM techniques to study the mechanical properties of materials * The use of nanoscale AFM and TEM techniques to study the electrical, thermal, and optical properties of materials * The use of nanoscale AFM and TEM techniques to develop new materials

This book provides a comprehensive overview of the latest advances in nanoscale AFM and TEM techniques for the study of elementary dislocation mechanisms in materials. It is a valuable resource for researchers in materials science, mechanics of materials, and other related fields.

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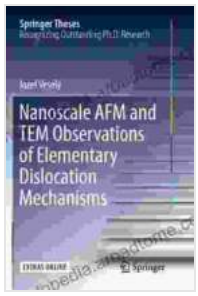

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