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Magnetization Relaxation under Applied Magnetic Fields
Self-Oscillations and Poincaré-Melnikov Theory; Chapter 6. Magnetization Switching; Physical Mechanisms of Precessional Switching; Critical Fields for Precessional Switching; Field-Pulse Duration for Precessional Switching; Switching under Nonrectangular Field Pulses (Inverse-Problem Approach); Chapter 7. Magnetization Dynamics under Time-Harmonic Excitation; LLG Dynamics in the Presence of Rotational Invariance; Periodic Magnetization Modes; Quasi-Periodic Magnetization Modes; Bifurcation Diagrams
Nonlinear Ferromagnetic Resonance, Foldover, and Switching Phenomena
Magnetization Dynamics under Deviations from Rotational Symmetry; Chapter 8. Spin-Waves and Parametric Instabilities; Linearized LLG Equation; Spin-Wave Perturbations; Stability Analysis; Spin-Wave Instabilities and Instability Diagrams; Spin-Wave Perturbations for Ultra-Thin Films; Chapter 9. Spin-Transfer-Driven Magnetization Dynamics; Spin-Transfer Modification of the LLG Equation; Stationary States; Self-Oscillations; Phase Portraits and Bifurcations; Stability Diagrams; Systems with Uniaxial Symmetry
Chapter 10. Stochastic Magnetization Dynamics
Stochastic Landau-Lifshitz and Landau-Lifshitz-Gilbert Equations; Fokker-Planck Equation for Stochastic Magnetization Dynamics; Analysis of Magnetization Dynamics by using Stochastic Processes on Graphs; Stationary Distributions and Thermal Transitions; Stochastic Magnetization Dynamics in Uniaxial Systems; Autocorrelation Function and Power Spectral Density; Stochastic Magnetization Dynamics in Nonuniformly Magnetized Ferromagnets; Chapter 11. Numerical Techniques for Magnetization Dynamics Analysis; Mid-Point Finite-Difference Schemes
Mid-Point Finite-Difference Schemes for Stochastic Magnetization Dynamics

Sommario/riassunto

As data transfer rates increase within the magnetic recording industry, improvements in device performance and reliability crucially depend on the thorough understanding on nonlinear magnetization dynamics at a sub-nanoscale level. This book offers a modern, stimulating approach to the subject of nonlinear magnetization dynamics by discussing important aspects such as the Landau-Lifshitz-Gilbert (LLG) equation, analytical solutions, and the connection between the general topological and structural aspects of dynamics. An exceptional research tool, providing an advanced understand
