

1. Record Nr.	UNINA9910647394303321
Autore	Nikhil Kumar C. S.
Titolo	Magnonic Devices : Numerical Modelling and Micromagnetic Simulation Approach // by C. S. Nikhil Kumar
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2023
ISBN	9783031226656 9783031226649
Edizione	[1st ed. 2023.]
Descrizione fisica	1 online resource (89 pages)
Collana	SpringerBriefs in Materials, , 2192-1105
Disciplina	530.41 621.3815
Soggetti	Magnetism Spintronics Nanoelectromechanical systems Materials science—Data processing Solid state physics Nanoscale Devices Computational Materials Science Electronic Devices
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Backward Volume Spin Waves in a Rectangular Geometry -- Magnetostatic Waves in Magnonic Crystals: A PWM Approach -- Field Localization in Striped Magnonic Crystal Waveguide -- Walkers Solution for Curved Magnonic Waveguide and Resonant Modes in Magnonic Ring -- Nano-contact Driven Spin Wave Excitations in Magnonic Cavity -- Magnetic Field Feedback Oscillator: A Micromagnetic Study.
Sommario/riassunto	This book briefly looks at numerical modeling and micromagnetic simulation results of magnonic crystals, which are periodically modulated magnonic devices regarded as the magnetic counterpart of photonic crystals with spin waves acting as the information carrier. Since the wavelength of the spin wave is several orders of magnitude shorter than that of electromagnetic waves of the same frequency,

magnonic crystals are promising candidates for miniaturization, especially in the fields of data storage and processing. The book begins by describing the dispersion relation of dipolar spin waves in a magnonic curved waveguide, solving Walker's equation in cylindrical coordinates, and then calculating the dispersion of exchange spin waves using perturbation theory. It describes simulated nano-contact-driven spin wave excitations in a magnonic cavity, featuring a design of an antidot magnonic crystal around the nano-contact, with the frequency of the spin wave mode generated lying within the band gap of the magnonic crystal. The proposed device behaves as a SWASER—Spin Wave Amplification by the Stimulated Emission of Radiation. This book will find interest among researchers and practitioners interested in the modeling, simulation, and design of novel magnonic devices.
