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Autore	Cook, Robert D.
Titolo	Concepts and applications of finite element analysis / Robert D. Cook, David S. Malkus, Michael E. Plesha
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Autore	Srinivasan G (Gopalan)
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Structures, and Applications; Copyright; Contents; Woodhead Publishing Series in Electronic and Optical Materials; Part One - Introduction to magnetoelectric materials and phenomena; 1 - Theory of magnetoelectric phenomena in composites; 1.1 Introduction; 1.2 Low-frequency ME in composites; 1.3 Resonance ME effect in composites; 1.4 ME effect at magnetic resonance; 1.5 Conclusions; References; 2 - Magnetoelectric characterization techniques; 2.1 Introduction; 2.2 Direct-ME effects; 2.3 Converse ME effects
2.4 Scanning probe microscopy techniques for ME effects in nanocompositesReferences; 3 - Layered multiferroic composites; 3.1 Ferromagnetic-ferroelectric composites; 3.2 Direct magnetoelectric effects; 3.3 Converse ME effects; 3.4 Conclusions; References; 4 - Multiferroic nanostructures; 4.1 Introduction; 4.2 Magnetoelectric magnetic film/piezoelectric slab heterostructures; References; 5 - Epitaxial multiferroic heterostructures; 5.1 Introduction; 5.2 BiFeO3 systems-related multiferroics; 5.3 La-manganite-related multiferroics; 5.4 Ferrite-related multiferroics; 5.5 Summary and prospects References6 - Recent advances in piezoelectric and magnetoelectric materials phenomena; 6.1 Introduction; 6.2 Magnetoelectric solid solution; 6.3 Magnetoelectric composite; 6.4 Recent advances in piezoelectric and magnetoelectric materials; 6.5 Recent advances in fabrication of magnetoelectric composites; 6.6 Recent advances in lead-free piezoelectric and magnetoelectric composites; 6.7 Conclusion; Acknowledgments; References; 7 - Magnetoelectric energy harvester; 7.1 Introduction; 7.2 Development of magnetoelectric energy harvester; 7.3 Magnetoelectric composite
7.4 Self-biased magnetoelectric energy harvester7.5 Multimode magnetoelectric energy harvester; 7.6 Low frequency and wideband magnetoelectric energy harvester; Acknowledgments; References; 8 - Magnetoelectric current sensor; 8.1 Introduction; 8.2 Development of magnetoelectric current sensors; 8.3 Conventional ME composites-based current sensors; 8.4 Self-biased ME composites-based current sensors; 8.5 ME transformer-based current sensors; 8.6 Magnetic noise and elimination; Acknowledgments; References; 9 - Microwave and millimeter-wave multiferroic devices; 9.1 Introduction
9.2 Converse ME effects at ferromagnetic resonance9.3 Hybrid spin-electromagnetic waves in composites; 9.4 Composites for high-frequency devices; 9.5 Multiferroic high-frequency devices; 9.6 Conclusion; References; 10 - Magnetoelectric composites for miniature antennas; 10.1 Introduction; 10.2 Effect of high permeability/permittivity ratio on antenna performance; 10.3 High permeability RF/microwave thick film materials; 10.4 Bulk composites; 10.5 Layered thin film systems; 10.6 Antenna design and characteristics; References; 11 - Magnetoelectric composites for medical application
11.1 Detailed background on wireless capsule endoscopy

Sommario/riassunto

Composite Magnetoelectrics: Materials, Structures, and Applications gives the reader a summary of the theory behind magnetoelectric phenomena, later introducing magnetoelectric materials and structures and the techniques used to fabricate and characterize them. Part two of the book looks at magnetoelectric devices. Applications include magnetic and current sensors, transducers for energy harvesting, microwave and millimeter wave devices, miniature antennas and medical imaging. The final chapter discusses progress towards magnetoelectric memory.Summarises clearly the theory behind magnetoelectr