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Titolo	Continuum Mechanics using Mathematica® : Fundamentals, Methods, and Applications // by Antonio Romano, Addolorata Marasco
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Descrizione fisica	1 online resource (XV, 480 p. 88 illus., 4 illus. in color.)
Collana	Modeling and Simulation in Science, Engineering and Technology, , 2164-3679
Disciplina	531.0285
Soggetti	Mechanics Mechanics, Applied Applied mathematics Engineering mathematics Mathematical physics Mathematical models Classical Mechanics Solid Mechanics Theoretical and Applied Mechanics Applications of Mathematics Theoretical, Mathematical and Computational Physics Mathematical Modeling and Industrial Mathematics
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Formato	Materiale a stampa
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Nota di bibliografia	Includes bibliographical references (pages [471]-473) and index.
Nota di contenuto	1. Elements of Linear Algebra -- 2. Vector Analysis -- 3. Finite and Infinitesimal Deformations -- 4. Kinematics -- 5. Balance Equations -- 6. Constitutive Equations -- 7. Symmetry Groups: Solids and Fluids -- 8. Wave Propagation -- 9. Fluid Mechanics -- 10. Linear Elasticity -- 11. Other Approaches to Thermodynamics -- 12. Fluid Dynamics and Meteorology -- 13. Fluid Dynamics and Ship Motion -- Appendix. A Brief Introduction to Weak Solutions -- Index.
Sommario/riassunto	This textbook's methodological approach familiarizes readers with the mathematical tools required to correctly define and solve problems in continuum mechanics. Covering essential principles and fundamental

applications, this second edition of Continuum Mechanics using Mathematica® provides a solid basis for a deeper study of more challenging and specialized problems related to nonlinear elasticity, polar continua, mixtures, piezoelectricity, ferroelectricity, magneto-fluid mechanics, and state changes (see A. Romano, A. Marasco, Continuum Mechanics: Advanced Topics and Research Trends, Springer (Birkhäuser), 2010, ISBN 978-0-8176-4869-5). Key topics and features:

- * Concise presentation strikes a balance between fundamentals and applications
- * Requisite mathematical background carefully collected in two introductory chapters and one appendix
- * Recent developments highlighted through coverage of more significant applications to areas such as wave propagation, fluid mechanics, porous media, linear elasticity. This second edition expands the key topics and features to include:
- * Two new applications of fluid dynamics: meteorology and navigation
- * New exercises at the end of the existing chapters
- * The packages are rewritten for Mathematica 9

Continuum Mechanics using Mathematica®: Fundamentals, Methods, and Applications is aimed at advanced undergraduates, graduate students, and researchers in applied mathematics, mathematical physics, and engineering. It may serve as a course textbook or self-study reference for anyone seeking a solid foundation in continuum mechanics.
