1. Record Nr. UNINA9910299697503321

Autore	Povstenko Yuriy
Titolo	Fractional thermoelasticity / / by Yuriy Povstenko
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2015
ISBN	3-319-15335-8
Edizione	[1st ed. 2015.]
Descrizione fisica	1 online resource (261 p.)
Collana	Solid Mechanics and Its Applications, , 0925-0042 ; ; 219
Disciplina	515.353
Soggetti	Thermodynamics Heat engineering Heat - Transmission Mass transfer Field theory (Physics) Mathematical physics Engineering Thermodynamics, Heat and Mass Transfer Classical and Continuum Physics Mathematical Applications in the Physical Sciences
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Preface -- 1 Essential of Fractional Calculus -- 2 Fractional Heat Conduction and Related Theories of Thermoelasticity -- 3 Thermoelasticity Based on Time-Fractional Heat Conduction Equation in Polar Coordinates -- 4 Axisymmetric Problems in Cylindrical Coordinates -- 5 Thermoelasticity Based on Time-Fractional Heat Conduction Equation in Spherical Coordinates -- 6 Thermoelasticity Based on Space-Time-Fractional Heat Conduction Equation -- 7 Thermoelasticity Based on Fractional Telegraph Equation -- 8 Fractional Thermoelasticity of Thin Shells -- 9 Fractional Advection-Diffusion Equation and Associated Diffusive Stresses.-Index.
Sommario/riassunto	This book is devoted to fractional thermoelasticity, i.e. thermoelasticity based on the heat conduction equation with differential operators of fractional order. Readers will discover how time-fractional differential operators describe memory effects and space-fractional differential

operators deal with the long-range interaction. Fractional calculus, generalized Fourier law, axisymmetric and central symmetric problems and many relevant equations are featured in the book. The latest developments in the field are included and the reader is brought up to date with current research. The book contains a large number of figures, to show the characteristic features of temperature and stress distributions and to represent the whole spectrum of order of fractional operators. This work presents a picture of the state-of-the-art of fractional thermoelasticity and is suitable for specialists in applied mathematics, physics, geophysics, elasticity, thermoelasticity and engineering sciences. Corresponding sections of the book may also be used as additional reading material for courses on heat and mass transfer, continuum mechanics, thermal stresses as well as in fractional calculus and its applications for graduate and postgraduate students. Extensive references are included in order to stimulate further studies.