1. Record Nr. UNINA9910877728203321

Autore	Dormieux Luc
Titolo	Microporomechanics / / Luc Dormieux, Djimedo Kondo, Franz-Josef Ulm
Pubbl/distr/stampa	Chichester, West Sussex, England ; ; Hoboken, NJ, : Wiley, c2006
ISBN	1-280-64883-X 9786610648832 0-470-03200-6 0-470-03199-9
Descrizione fisica	1 online resource (346 p.)
Altri autori (Persone)	KondoDjimedo UlmF.-J (Franz-Josef)
Disciplina	620.11692
Soggetti	Porous materials - Mechanical properties Porous materials - Mechanical properties - Mathematical models Micromechanics
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 (p. [319]-322) and index.
Nota di contenuto	Microporomechanics; Contents; Preface; Notation; 1 A Mathematical Framework for Upscaling Operations; 1.1 Representative Elementary Volume (rev); 1.2 Averaging Operations; 1.2.1 Apparent and Intrinsic Averages; 1.2.2 Spatial Derivatives of an Average; 1.2.3 Time Derivative of an Average; 1.2.4 Spatial and Time Derivatives of e; 1.3 Application to Balance Laws; 1.3.1 Mass Balance; 1.3.2 Momentum Balance; 1.4 The Periodic Cell Assumption; 1.4.1 Introduction; 1.4.2 Spatial and Time Derivative of e in the Periodic Case; 1.4.3 Spatial and Time Derivative of e of in the Periodic Case 1.4.4 Application: Micro- versus Macroscopic CompatibilityPart I Modeling of Transport Phenomena; 2 Micro(fluid)mechanics of Darcy's Law; 2.1 Darcy's Law; 2.2 Microscopic Derivation of Darcy's Law; 2.2.1 Thought Model: Viscous Flow in a Cylinder; 2.2.2 Homogenization of the Stokes System; 2.2.3 Lower Bound Estimate of the Permeability Tensor; 2.2.4 Upper Bound Estimate of the Permeability Tensor; 2.3 Training Set: Upper and Lower Bounds of the Permeability of a 2-D Microstructure; 2.3.1 Lower Bound; 2.3.2 Upper Bound; 2.3.3

Sommario/riassunto

Intended as a first introduction to the micromechanics of porous media, this book entitled "Microporomechanics" deals with the mechanics and physics of multiphase porous materials at nano and micro scales. It is composed of a logical and didactic build up from fundamental concepts to state-of-the-art theories. It features four parts: following a brief introduction to the mathematical rules for upscaling operations, the first part deals with the homogenization of transport properties of porous media within the context of asymptotic expansion techniques. The second part deals with linear micropo