1. Record Nr. UNINA9910143590403321 Autore **Dormieux Luc** Titolo Microporomechanics [[electronic resource] /] / Luc Dormieux, Djimedo Kondo, Franz-Josef Ulm Chichester, West Sussex, England; ; Hoboken, NJ, : Wiley, c2006 Pubbl/distr/stampa **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 Materiale a stampa **Formato** Livello bibliografico Monografia Description based upon print version of record. Note generali 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

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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