1. Record Nr. UNINA9910488722603321

Titolo	Coupled System Pavement - Tire - Vehicle : A Holistic Computational Approach / / edited by Michael Kaliske, Markus Oeser, Lutz Eckstein, Sabine Leischner, Wolfram Ressel, Frohmut Wellner
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2021
ISBN	3-030-75486-3
Edizione	[1st ed. 2021.]
Descrizione fisica	1 online resource (291 pages)
Collana	Lecture Notes in Applied and Computational Mechanics, , 1860-0816 ; ; 96
Disciplina	625.85
Soggetti	Building materials Engineering mathematics Engineering - Data processing Automotive engineering Transportation engineering Traffic engineering Building Materials Mathematical and Computational Engineering Applications Automotive Engineering Transportation Technology and Traffic Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Michael Kaliske, Ronny Behnke, Felix Hartung, Ines Wollny -- Numerical Simulation of Asphalt Compaction and Asphalt Performance -- Computational Methods for Analyses of Different Functional Properties of Pavements -- Experimental Methods for the Mechanical Characterization of Asphalt Concrete at Different Length Scales: Bitumen, Mastic, Mortar and Asphalt Mixture -- Experimental and Simulative Methods for the Analysis of Vehicle-Tire-Pavement Interaction -- Characterization and Evaluation of Different Asphalt Properties Using Microstructural Analysis -- Numerical Friction Models Compared to Experiments on Real and Artificial Surfaces -- Multiscale Computational Approaches for Asphalt Pavements under Rolling Tire

Load -- Simulation Chain: From the Material Behavior to the Thermo-mechanical Long-term Response of Asphalt Pavements and the Alteration of Functional Properties (Surface Drainage).

Sommario/riassunto

This book summarizes research being pursued within the Research Unit FOR 2089, funded by the German Research Foundation (DFG), the goal of which is to develop the scientific base for a paradigm shift towards dimensioning, structural realization and maintenance of pavements, and prepare road infrastructure for future requirements. It provides a coupled thermo-mechanical model for a holistic physical analysis of the pavement-tire-vehicle system: based on this model, pavement structures and materials can be optimized so that new demands become compatible with the main goal – durability of the structures and the materials. The development of these new and qualitatively improved modelling approaches requires a holistic procedure through the coupling of theoretical numerical and experimental approaches as well as an interdisciplinary and closely linked handling of the coupled pavement-tire-vehicle system. This interdisciplinary research provides a deeper understanding of the physics of the full system through complex, coupled simulation approaches and progress in terms of improved and, therefore, more durable and sustainable structures.