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Descrizione fisica	1 online resource (289 pages)
Collana	Modern Aspects of Electrochemistry, , 2197-7941 ; ; 62
Disciplina	620.00420285
Soggetti	Electric batteries Materials Computer-aided engineering Fuel cells Electrochemistry Mathematical models Engineering - Data processing Batteries Computer-Aided Engineering (CAD, CAE) and Design Fuel Cells Mathematical Modeling and Industrial Mathematics Data Engineering
Lingua di pubblicazione	Inglese
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Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Applications of Commercial Software for Lithium-Ion Battery Modeling and Simulation -- In situ Measurement of Current Distribution in Large-format Li-ion Cells -- Mesoscale Modeling and Analysis in Electrochemical Energy Systems -- Development of Computer Aided Design Tools for Automotive Batteries -- Experimental Simulations of Field Induced Mechanical Abuse Conditions -- Abuse Response of Batteries subjected to Mechanical Impact -- Accelerating Battery Simulations by using High Performance Computing and Opportunities with Machine Learning. .

This edited volume, with contributions from the Computer Aided Engineering for Batteries (CAEBAT) program, provides firsthand insights into nuances of implementing battery models in actual geometries. It discusses practical examples and gaps in our understanding, while reviewing in depth the theoretical background and algorithms. Over the last ten years, several world-class academics, automotive original equipment manufacturers (OEMs), battery cell manufacturers and software developers worked together under an effort initiated by the U. S. Department of Energy to develop mature, validated modeling tools to simulate design, performance, safety and life of automotive batteries. Until recently, battery modeling was a niche focus area with a relatively small number of experts. This book opens up the research topic for a broader audience from industry and academia alike. It is a valuable resource for anyone who works on battery engineering but has limited hands-on experience with coding.
