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Nota di contenuto	1 -- Introduction. 2 -- Full 3D Modeling of Planar Fuel Cells. 3 -- Development of Reduced PEMFC Models. 4 -- development of Reduced P-SOFC Models. 5 -- Integrated Stochastic and Deterministic Sensitivity Analysis of Cell and Stack Performances. 6 -- Conclusions.
Sommario/riassunto	This book focuses on novel reduced cell and stack models for proton exchange membrane fuel cells (PEMFCs) and planar solid oxide fuel cells (P-SOFCs) that serve to reduce the computational cost by two orders of magnitude or more with desired numerical accuracy, while capturing both the average properties and the variability of the dependent variables in the 3D counterparts. The information provided can also be applied to other kinds of plate-type fuel cells whose flow fields consist of parallel plain channels separated by solid ribs. These

fast and efficient models allow statistical sensitivity analysis for a sample size in the order of 103 without prohibitive computational cost to be performed to investigate not only the individual, but also the simultaneous effects of a group of varying geometrical, material, and operational parameters. This provides important information for cell/stack design, and to illustrate this, Monte Carlo simulation of the reduced P-SOFC model is conducted at both the single-cell and stack levels.