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Titolo	Stochastic methods for boundary value problems : numerics for high-dimensional PDEs and applications / / Karl K. Sabelfeld, Nikolai A. Simonov
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ISBN	3-11-047916-8 3-11-047945-1
Descrizione fisica	1 online resource (x, 198 pages) : colour illustrations
Disciplina	519.2/3
Soggetti	Boundary value problems - Numerical solutions Stochastic analysis Random walks (Mathematics) Electronic books.
Lingua di pubblicazione	Inglese
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Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Frontmatter -- Preface -- Contents -- 1. Introduction -- 2. Random walk algorithms for solving integral equations -- 3. Random walk-on-boundary algorithms for the Laplace equation -- 4. Walk-on-boundary algorithms for the heat equation -- 5. Spatial problems of elasticity -- 6. Variants of the random walk on boundary for solving stationary potential problems -- 7. Splitting and survival probabilities in random walk methods and applications -- 8. A random WOS-based KMC method for electron-hole recombinations -- 9. Monte Carlo methods for computing macromolecules properties and solving related problems -- Bibliography
Sommario/riassunto	This monograph is devoted to random walk based stochastic algorithms for solving high-dimensional boundary value problems of mathematical physics and chemistry. It includes Monte Carlo methods where the random walks live not only on the boundary, but also inside the domain. A variety of examples from capacitance calculations to electron dynamics in semiconductors are discussed to illustrate the viability of the approach. The book is written for mathematicians who

work in the field of partial differential and integral equations, physicists and engineers dealing with computational methods and applied probability, for students and postgraduates studying mathematical physics and numerical mathematics. Contents: Introduction Random walk algorithms for solving integral equations Random walk-on-boundary algorithms for the Laplace equation Walk-on-boundary algorithms for the heat equation Spatial problems of elasticity Variants of the random walk on boundary for solving stationary potential problems Splitting and survival probabilities in random walk methods and applications A random WOS-based KMC method for electron-hole recombinations Monte Carlo methods for computing macromolecules properties and solving related problems Bibliography

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