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	Sommario/riassunto	This book is the third volume of three volume series recording the "Radon Special Semester 2011 on Multiscale Simulation & Analysis in Energy and the Environment" taking place in Linz, Austria, October 3-7, 2011. This book surveys recent developments in the analysis of wave propagation problems. The topics covered include aspects of the forward problem and problems in inverse problems, as well as applications in the earth sciences. Wave propagation problems are

ubiquitous in environmental applications such as seismic analysis, acoustic and electromagnetic scattering. The design of efficient numerical methods for the forward problem, in which the scattered field is computed from known geometric configurations is very challenging due to the multiscale nature of the problems. Even more challenging are inverse problems where material parameters and configurations have to be determined from measurements in conjunction with the forward problem. This book contains review articles covering several state-of-the-art numerical methods for both forward and inverse problems. This collection of survey articles focusses on the efficient computation of wave propagation and scattering is a core problem in numerical mathematics, which is currently of great research interest and is central to many applications in energy and the environment. Two generic applications which resonate strongly with the central aims of the Radon Special Semester 2011 are forward wave propagation in heterogeneous media and seismic inversion for subsurface imaging. As an example of the first application, modelling of absorption and scattering of radiation by clouds, aerosol and precipitation is used as a tool for interpretation of (e.g.) solar, infrared and radar measurements, and as a component in larger weather/climate prediction models in numerical weather forecasting. As an example of the second application, inverse problems in wave propagation in heterogeneous media arise in the problem of imaging the subsurface below land or marine deposits. The book records the achievements of Workshop 3 "Wave Propagation and Scattering, Inverse Problems and Applications in Energy and the Environment". It brings together key numerical mathematicians whose interest is in the analysis and computation of wave propagation and scattering problems, and in inverse problems, together with practitioners from engineering and industry whose interest is in the applications of these core problems.