Inverse Methods in Physics

B.N. Zakhariev, Moscow; **A.A. Suzko,** Minsk

Direct and Inverse Problems

Potentials in Quantum Scattering

1990. Approx. 200 pp. 42 figs. Softcover DM 48,– ISBN 3-540-52484-3

This textbook can almost be viewed as a "how-to" manual for solving quantum inverse problems, that is, for deriving the potential from spectra or scattering data and also, as somewhat of a quantum "picture book" which should enhance the reader's quantum intuition. The formal exposition of inverse methods is paralleled by a discussion of the direct problem. Differential and finite-difference equations are presented side by side. The common features and (dis)advantages of a variety of solution methods are analyzed.
To foster a better understanding, the physical meaning of the mathematical quantities are discussed explicitly. Wave confinement in continuum bound states, resonance and collective tunneling, energy shifts and the spectral and phase equivalence of various interactions are some of the physical problems covered.

P.C. Sabatier, University of Languedoc, Montpellier (Ed.)

Inverse Methods in Action

Proceedings of the Multicentennials Meeting on Inverse Problems, Montpellier, November 27th – December 1, 1989

1990. XIV, 636 pp. 125 figs. Hardcover DM 138,– ISBN 3-540-51994-7

The basic idea of inverse methods is to extract from the evaluation of measured signals the details of the object emitting them. The applications range from physics and engineering to geology and medicine (tomography). Although most contributions are rather theoretical in nature, this volume is of practical value to experimentalists and engineers as well as of interest to mathematicians. The review lectures and contributed papers are grouped into eight chapters dedicated to tomography, distributed parameter inverse problems, spectral and scattering inverse problems (exact theory), wave propagation and scattering (approximations); miscellaneous inverse problems and applications and inverse methods in nonlinear mathematics.

R.G. Newton, Indiana University, Bloomington, IN

Inverse Schrödinger Scattering in Three Dimensions

1989. X, 170 pp. 1 fig. (Texts and Monographs in Physics)
Hardcover DM 68,– ISBN 3-540-50563-6

K. Chadan, Laboratoire de Physique Théorique, Université de Paris-Sud, Orsay; **P.C. Sabatier,** Université des Sciences et Techniques du Languedoc, Montpellier

Inverse Problems in Quantum Scattering Theory

With a Foreword by R.G. Newton

2nd rev. and expanded ed. 1989. XXXI, 499 pp. 24 figs.
(Texts and Monographs in Physics)
Hardcover DM 138,– ISBN 3-540-18731-6

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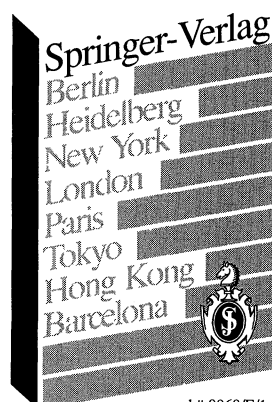
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