1. Record Nr. UNISA996466587403316

Autore	Gorenflo Rudolf
Titolo	Abel integral equations : analysis and applications / / Rudolf Gorenflo, Sergio Vessella
Pubbl/distr/stampa	Berlin : , : Springer-Verlag, , [1991] ©1991
ISBN	3-540-46949-4
Edizione	[1st ed. 1991.]
Descrizione fisica	1 online resource (X, 222 p.)
Collana	Lecture notes in mathematics ; ; 1461
Disciplina	515.45
Soggetti	Abel integral equations
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Basic theory and representation formulas -- Applications of Abel's original integral equation: Determination of potentials -- Applications of a transformed abel integral equation -- Smoothing properties of the abel operators -- Existence and uniqueness theorems -- Relations between abel transform and other integral transforms -- Nonlinear abel integral equations of second kind -- Illposedness and stabilization of linear abel integral equations of first kind -- On numerical treatment of first kind abel integral equations.
Sommario/riassunto	In many fields of application of mathematics, progress is crucially dependent on the good flow of information between (i) theoretical mathematicians looking for applications, (ii) mathematicians working in applications in need of theory, and (iii) scientists and engineers applying mathematical models and methods. The intention of this book is to stimulate this flow of information. In the first three chapters (accessible to third year students of mathematics and physics and to mathematically interested engineers) applications of Abel integral equations are surveyed broadly including determination of potentials, stereology, seismic travel times, spectroscopy, optical fibres. In subsequent chapters (requiring some background in functional analysis) mapping properties of Abel integral operators and their relation to other integral transforms in various function spaces are investi- gated, questions of existence and uniqueness of solutions of linear and nonlinear Abel integral equations are treated, and for

equations of the first kind problems of ill-posedness are discussed. Finally, some numerical methods are described. In the theoretical parts, emphasis is put on the aspects relevant to applications.