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Autore	Freeden W (Willi)
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Descrizione fisica	1 online resource (XIX, 482 p. 196 illus., 168 illus. in color.)
Collana	Geosystems Mathematics, , 2510-1544
Disciplina	515.7
Soggetti	Potential theory (Mathematics) Teoria del potencial (Matemàtica) Llibres electrònics
Lingua di pubblicazione	Inglese
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Nota di contenuto	Introductory Remarks -- Part I: Gravitation and Gravimetry -- Gravitation -- Gravimetry -- Part II: Potential Theory -- Classical Context -- Newton-Haar Mollifier Theory and Application -- Disturbing Potential -- Part III: Surface Decorrelation -- Space versus Frequency Surface Modeling -- Surface Applications -- Part IV: Inverse Potential Theory -- Gravimetry as an Ill-Posed Inverse Problem -- Part V: Volume Decorrelation -- Volume Methodology -- Volume Applications -- Part VI: Decorrelative Potential Methods -- Decorrelative Monopole Potential Based Gravimetry -- Decorrelative Dipole Potential Based Magnetometry -- Decorrelative Acoustic Potential Based Exploration -- Decorrelative Elastic Potential Based Exploration -- Concluding Remarks.
Sommario/riassunto	This monograph presents the geoscientific context arising in decorrelative gravitational exploration to determine the mass density distribution inside the Earth. First, an insight into the current state of research is given by reducing gravimetry to mathematically accessible, and thus calculable, decorrelated models. In this way, the various unresolved questions and problems of gravimetry are made available to a broad scientific audience and the exploration industry. New theoretical developments will be given, and innovative ways of

modeling geologic layers and faults by mollifier regularization techniques are shown. This book is dedicated to surface as well as volume geology with potential data primarily of terrestrial origin. For deep geology, the geomathematical decorrelation methods are to be designed in such a way that depth information (e.g., in boreholes) may be canonically entered. Bridging several different geo-disciplines, this book leads in a cycle from the potential measurements made by geoengineers, to the cleansing of data by geophysicists and geoengineers, to the subsequent theory and model formation, computer-based implementation, and numerical calculation and simulations made by geomathematicians, to interpretation by geologists, and, if necessary, back. It therefore spans the spectrum from geoengineering, especially geodesy, via geophysics to geomathematics and geology, and back. Using the German Saarland area for methodological tests, important new fields of application are opened, particularly for regions with mining-related cavities or dense development in today's geo-exploration. .