Book Review

“*Geophysics for the Mineral Exploration Geoscientist*” by Michael Dentith and Stephen T. Mudge, Cambridge University Press, 2014; ISBN: 978-0-521-80951-1 (hardback), USD 75.00

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The global demand for minerals is growing as global population expands, since they are used in an increasing number of applications, many associated with the deployment of new technologies. This has caused an increased use of geophysical methods in various stages of exploration and management of several types of mineral deposits. This book presents an excellent guide to all the state-of-the-art methods that are currently in use by the geophysical exploration industry in the search for mineral deposits. The two authors, Michael Dentith and Stephen Mudge, both experts in this field, combined the knowledge of academia and industry providing the fundamentals needed to develop a quantitative understanding of the physical processes and the mathematics of the geophysical methods, explaining data acquisition, processing and accurate interpretation including presentation and analysis of new petrophysical data, and presenting examples from all the main types of mineral deposits around the world.

The book is organized into six chapters. The first chapter of the book is an introduction to the basic geophysical methods used for mining exploration including a particularly useful paragraph that presents the cost for various geophysical methods. The second chapter is devoted to the fundamental principles and practices of geophysical data acquisition, processing and interpretation. It describes concepts such as the nature of data and geophysical responses, noise, sampling strategies, signal processing, visualization, qualitative and quantitative analysis including

geophysical inversion and forward modeling approaches. The rest of the book presents in detail all common geophysical methods organizing them into four categories—chapters, namely gravity and magnetic methods, radiometric method, electrical and electromagnetic methods and finally, seismic methods. For each technique the authors provide a balanced description between the theory and the application with the support of numerous high definition explanatory figures, and tables. They deliver step-by-step mathematical treatments accompanied by numerous examples as well as real-world applications.

In addition to the contents of the book, the authors provide online appendices describing less common techniques in mining exploration such as magnetometric, magnetotelluric electromagnetic, radio and radar frequency, as well as seismic refraction method. It is also worth mentioning that each chapter of the book is followed by a small summary emphasizing the important notes, review questions and some suggested further reading, which I consider especially useful for teaching purposes.

Overall this 440-page book is exceptionally well written, self-contained and provides important information for anyone interested in geophysical methods for the mineral exploration. It covers knowledge from how to choose the suitable method and best practices for data acquisition, up to the interpretation and representation of the results. It is full of colored, high-quality images that help the reader to conceive the presented material and make the book more appealing. Concluding, it is an excellent reference and a textbook for Earth science undergraduates, graduates, researchers and professionals in the mining industry and exploration geophysics.

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