Understanding fluid flow in the subsurface is critical for hydrocarbon production, groundwater management, environmental remediation, and sequestration of greenhouse gases. A relatively recent addition to the available technologies for modeling subsurface flow and transport is 3D streamline simulation. The development of the technology has been driven by its efficiency compared to conventional finite-difference simulation, especially for flow simulation of large, multimillion-cell geologic models. The speed and versatility of the technology have led to many novel applications.

This book provides a systematic exposition of current streamline simulation technology: its foundations, historical precedents, applications, field studies, and limitations. We emphasize the unique features of streamline technology that in many ways complement conventional finite-difference simulation. Part of our motivation in developing this textbook has been to fill gaps in the mathematical foundations and provide a rigorous presentation of streamline simulation technology that had not existed before.

The book should appeal to a broad audience in petroleum engineering and hydrogeology. It has been designed for use by undergraduate and graduate students, current practitioners, educators, and researchers. The book includes a CD with a working streamline simulator and exercises to provide the reader with hands-on experience with the technology.

About the Authors

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