Streamline Simulation: Theory and Practice

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Description

Streamline Simulation: Theory and Practice presents a systematic exposition of current streamline simulation technology—its foundations, historical precedents, applications, field studies, and limitations. This text book emphasizes the unique features of streamline technology that in many ways complement conventional finite-difference simulation. 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. Included in the book is a CD-ROM with a working streamline simulator and exercises to provide the reader with hands-on experience with the technology.
Streamline simulation is now used for 3D high-resolution flow simulation for two-phase and three-phase fluid flow, including the effects of compressibility, gravity, and capillarity. The speed and versatility of the technology also have led to many other novel applications. These streamline technologies have essentially replaced the older 2D streamtube approaches and are now reaching a level of maturity where they can be used as routinely as finite-difference simulation. Nevertheless, 3D streamline simulation is a much younger technology than conventional finite-difference-based flow simulation... Streamlines Streamtubes Streamfunctions and Simulation. 31. Tekijänoikeudet. Kirjailijat. Akhil Datta-Gupta, Michael J. King, Society of Petroleum Engineers. A propagation equation can be derived using asymptotic ray theory which has been used extensively in electromagnetic and seismic wave propagation (Virieux et al., 1994). The asymptotic method draws upon an analogy between the propagating pressure "front" and a propagating wave front, and many of the concepts such as rays and propagating fronts have their counterparts in Petroleum Engineering (Gupta and King, 2007).