Fluid Dynamics in Complex Fractured-Porous Systems. Geophysical Monograph Series

Description: Despite of many years of studies, predicting fluid flow, heat, and chemical transport in fractured–porous media remains a challenge for scientists and engineers worldwide. This monograph is the third in a series on the dynamics of fluids and transport in fractured rock published by the American Geophysical Union (Geophysical Monograph Series, Vol. 162, 2005; and Geophysical Monograph, No. 122, 2000). This monograph is dedicated to the late Dr. Paul Witherspoon for his seminal influence on the development of ideas and methodologies and the birth of contemporary fractured rock hydrogeology, including such fundamental and applied problems as environmental remediation; exploitation of oil, gas, and geothermal resources; disposal of spent nuclear fuel; and geotechnical engineering.

This monograph addresses fundamental and applied scientific questions and is intended to assist scientists and practitioners bridge gaps in the current scientific knowledge in the areas of theoretical fluids dynamics, field measurements, and experiments for different practical applications. Readers of this book will include researchers, engineers, and professionals within academia, Federal agencies, and industry, as well as graduate/undergraduate students involved in theoretical, experimental, and numerical modeling studies of fluid dynamics and reactive chemical transport in the unsaturated and saturated zones, including studies pertaining to petroleum and geothermal reservoirs, environmental management and remediation, mining, gas storage, and radioactive waste isolation in underground repositories.

Volume highlights include discussions of the following:

- Fundamentals of using a complex systems approach to describe flow and transport in fractured–porous media.
- Methods of Field Measurements and Experiments
- Collective behavior and emergent properties of complex fractured rock systems
- Connection to the surrounding environment
- Multi-disciplinary research for different applications

Contents:

Contributors vii

Preface ix

Introduction: Paul Witherspoon and the Birth of Contemporary Fractured Rock Hydrogeology
R. Allan Freeze, Iraj Javandel, and Shlomo P. Neuman 1

1 A Complex Systems Approach to Describing Flow and Transport in Fractured-Porous Media
Boris Faybishenko, Sally M. Benson, John E. Gale, and Fred Molz 5

Part I: Methods of Field Measurements and Experiments

2 Fracture Flow and Underground Research Laboratories for Nuclear Waste Disposal and Physics Experiments
Joseph S. Y. Wang and John A. Hudson 21

3 Permeability Structure of a Strike-Slip Fault
Kenzi Karasaki, Celia T. Onishi, and Junichi Goto 43

4 Feasibility of Long-Term Passive Monitoring of Deep Hydrogeology with Flowing Fluid Electric Conductivity Logging Method
Prabhakar Sharma, Chin-Fu Tsang, Christine Doughty, Auli Niemi, and Jacob Bensabat 53

Part II: Collective Behavior and Emergent Properties of Complex Fractured Rock Systems

5 Particle Swarms in Fractures
Eric Boomsma and Laura J. Pyrak-Nolte 65

6 The Effect of Chemical Osmosis on Oil and Gas Production from Fractured Shale Formations
Perapon Fakcharoenphol, Basak Kurtoglu, Hossein Kazemi, Sarinya Charoenwongsa, and Yu-Shu Wu 85

7 An Experimental Investigation of Stress-Dependent Permeability and Permeability Hysteresis Behavior in Rock Fractures
Da Huo and Sally M. Benson 99

8 Permeability of Partially Cemented Fractures
Michael C. Tsenn 115

9 An Emergent Conductivity Relationship for Water Flow Based on Minimized Energy Dissipation: From Landscapes to Unsaturated Soils
Hui-Hai Liu 129

10 Comparison of Simulated Flow in a Discrete Fracture Laboratory Sample Based on Measured Average and Spatially Varying Hydraulic Conductivity
Eunjeong Seok and John E. Gale 137

Part III: Connection to the Surrounding Environment

11 Fractures as Advective Conduits at the Earth-Atmosphere Interface
Maria Inés Dragila, Uri Nachshon, and Noam Weisbrod 161

12 Quantifying Water Flow and Retention in an Unsaturated Fracture-Facial Domain
John R. Nimmo and Siamak Malek-Mohammadi 169

Part IV: Multidisciplinary Research for Different Applications

13 Plutonium Transport in Soil and Plants: An Interdisciplinary Study Motivated by Lysimeter Experiments at the Savannah River Site
Fred Molz, Inci Demirkanli, Shannon Thompson, Dan Kaplan, and Brian Powell 183

14 Experimental and Modeling Studies of Episodic Air-Water Two-Phase Flow in Fractures and Fracture Networks
Thomas Wood and Hai Huang 209

15 Simulation of THM Processes in Fractured Reservoirs
Philip H. Winterfeld and Yu-Shu Wu 229

Index 243


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