

1. Record Nr.	UNINA9910741157803321
Autore	Zhang Fengshou
Titolo	Coupled Thermo-Hydro-Mechanical Processes in Fractured Rock Masses : Discrete Element Modeling and Engineering Applications / / by Fengshou Zhang, Branko Damjanac, Jason Furtney
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2023
ISBN	3-031-25787-1
Edizione	[1st ed. 2023.]
Descrizione fisica	1 online resource (316 pages)
Altri autori (Persone)	DamjanacBranko FurtneyJason
Disciplina	624.131
Soggetti	Geotechnical engineering Water Hydrology Cogeneration of electric power and heat Fossil fuels Earth sciences Rock mechanics Soil mechanics Geotechnical Engineering and Applied Earth Sciences Fossil Fuel Earth Sciences Soil and Rock Mechanics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Chapter 1: Introduction to the Discrete Element Method (DEM) and Related Fluid Mechanics Concepts -- Chapter 2: Discrete Element Modeling of Hydraulic Fracturing -- Chapter 3: DEM Coupled with Computational Fluid Dynamics (CFD) -- Chapter 4: DEM Coupled with Dynamic Fluid Mesh (DFM) -- Chapter 5: DEM Coupled with Lattice-Boltzmann Method (LBM) -- Chapter 6: Hydraulic Stimulation of Naturally Fractured Reservoirs -- Chapter 7: Models of Stimulation and Production from Enhanced Geothermal Systems -- Chapter 8: Hydraulic

Sommario/riassunto

The subject of thermo-hydro-mechanical coupled processes in fractured rock masses has close relevance to energy-related deep earth engineering activities, such as enhanced geothermal systems, geological disposal of radioactive waste, sequestration of CO₂, long-term disposal of waste water and recovery of hydrocarbons from unconventional reservoirs. Despite great efforts by engineers and researchers, comprehensive understanding of the thermo-hydro-mechanical coupled processes in fractured rock mass remains a great challenge. The discrete element method (DEM), originally developed by Dr. Peter Cundall, has become widely used for the modeling of a rock mass, including its deformation, damage, fracturing and stability. DEM modeling of the coupled thermo-hydro-mechanical processes in fractured rock masses can provide some unique insights, to say the least, for better understanding of those complex issues. The authors of this book have participated in various projects involving DEM modeling of coupled thermo-hydro-mechanical processes during treatment of a rock mass by fluid injection and/or extraction and have provided consulting services to some of the largest oil-and-gas companies in the world. The breadth and depth of our engineering expertise are reflected by its successful applications in the major unconventional plays in the world, including Permian, Marcellus, Bakken, Eagle Ford, Horn River, Chicantepec, Sichuan, Ordos and many more. The unique combination of the state-of-the-art numerical modeling techniques with state-of-the-practice engineering applications makes the presented material relevant and valuable for engineering practice. We believe that it is beneficial to share the advances on this subject and promote some further development. <.
