1.	Record Nr.	UNINA9910484233303321
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	Titolo	Adaptive Analysis of Damage and Fracture in Rock with Multiphysical Fields Coupling [[electronic resource] /] / by Yongliang Wang
	Pubbl/distr/stampa	Singapore : , : Springer Singapore : , : Imprint : Springer, , 2021
	ISBN	981-15-7197-X
	Edizione	[1st ed. 2021.]
	Descrizione fisica	1 online resource (204 pages)
	Disciplina	624.15132
	Soggetti	Geotechnical engineering Applied mathematics Engineering mathematics Geotechnical Engineering & Applied Earth Sciences Mathematical and Computational Engineering
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di contenuto	Introduction -- Finite element algorithm for continuum damage evolution of rock considering hydro-mechanical coupling -- Finite element analysis for continuum damage evolution and wellbore stability of transversely isotropic rock considering hydro-mechanical coupling -- Finite element analysis for continuum damage evolution and inclined wellbore stability of transversely isotropic rock considering hydro-mechanical-chemical coupling. .
	Sommario/riassunto	This book mainly focuses on the adaptive analysis of damage and fracture in rock, taking into account multiphysical fields coupling (thermal, hydro, mechanical, and chemical fields). This type of coupling is a crucial aspect in practical engineering for e.g. coal mining, oil and gas exploration, and civil engineering. However, understanding the influencing mechanisms and preventing the disasters resulting from damage and fracture evolution in rocks require high-precision and reliable solutions. This book proposes adaptive numerical algorithms and simulation analysis methods that offer significant advantages in terms of accuracy and reliability. It helps readers understand these innovative methods quickly and easily. The content consists of: (1) a finite element algorithm for modeling the continuum damage evolution

in rocks, (2) adaptive finite element analysis for continuum damage evolution and determining the wellbore stability of transversely isotropic rock, (3) an adaptive finite element algorithm for damage detection in non-uniform Euler–Bernoulli beams with multiple cracks, using natural frequencies, (4) adaptive finite element–discrete element analysis for determining multistage hydrofracturing in naturally fractured reservoirs, (5) adaptive finite element–discrete element analysis for multistage supercritical CO_2 fracturing and microseismic modeling, and (6) an adaptive finite element–discrete element–finite volume algorithm for 3D multiscale propagation of hydraulic fracture networks, taking into account hydro-mechanical coupling. Given its scope, the book offers a valuable reference guide for researchers, postgraduates and undergraduates majoring in engineering mechanics, mining engineering, geotechnical engineering, and geological engineering. .