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Nota di contenuto	Introduction -- Seismic Response Probabilistic Analysis Method for Earth-rock Dams -- Stochastic Dynamic Analysis of CFRD Considering Randomness of Ground Motion -- Stochastic Dynamic Analysis of CFRD Considering Uncertainties in Material Parameters -- Stochastic Dynamic Analysis of CFRD Considering the Coupled Randomness of Ground Motion and Material Parameters -- Stochastic Dynamic Response Analysis and Seismic Evaluation for a 3-D High CFRDs -- Stochastic Seismic Analysis and Performance Safety Evaluation for Slope Stability of High CFRDs -- Performance Seismic Safety Evaluation.
Sommario/riassunto	This open access book provides a complete probabilistic analysis method and a performance-based seismic safety evaluation for high concrete faced rockfill dam (CFRD). Combined with random sample generation and reliability analysis methods, the dynamic response characteristics and reliability level of CFRD under various random factors are comprehensively described. In Chapter 2, a random ground motion model based on spectral representation-random function and a high-dimensional random variable generation method based on GF-discrepancy are established. Combined with probability density evolution method (PDEM) and the random sample generation methods to verify its effectiveness and reliability for nonlinear complex geotechnical engineering. In Chapter 3, the dynamic response and probabilistic characteristics of high CFRD under random ground motion

are revealed based on the elastoplastic analysis. A performance-based seismic safety evaluation method is established. In Chapter 4, the influence of material parameter randomness on dynamic response and seismic safety of high CFRD is studied from the perspective of stochastic dynamics and probability. In Chapter 5, the stochastic dynamic response and probability distribution of high CFRD under the coupled random action of ground motion and material parameters are systematically studied, and the performance-based seismic safety evaluation framework is improved. In Chapter 6, The stochastic dynamic response of 3D high CFRD is studied, and the failure performance index and performance level based on overstress volume ratio combined with overstress accumulation time are discussed. The performance-based seismic safety evaluation framework is further improved. In Chapter 7, combined with the finite element dynamic time-history analysis method considering the softening effect of rockfill, a performance-based seismic safety evaluation framework for dam slope stability of high CFRD under multiple random factors is systematically explored from the perspective of stochastic dynamics and probability. In Chapter 8, The performance indexes of seismic safety evaluation for high CFRDs are suggested and the corresponding performance level with probability assurance is put forward. The multi-seismic intensity - multi-performance target - failure probability performance relationship is established, and a performance-based seismic safety evaluation framework is initially formed. This book can be used as a reference for scholars studying random vibration and reliability analysis, as well as for scholars studying dam safety evaluation.
