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Earthquake Ground Motion Strong Ground Motion Seismology Ground Motion Seismology Earthquake Ground Motion Earthquake Motion and Ground Conditions Ground Motion and Engineering Seismology State-of-the-art Study Concerning Near-field Earthquake Ground Motion Seismic Ground Motion in Large Urban Areas Strong Ground Motion Stochastic Model for Earthquake Ground Motion Using Wavelet Packets Earthquake Ground Motion and Its Effects on Structures Procedures for Estimating Earthquake Ground Motions Influence of Local Geology on Earthquake Ground Motion Characteristics of the Strong Ground Motion Recorded During the October 15, 1979 Imperial Valley Earthquake Strong Motion Earthquake Accelerograms Index Volume Simulation of Earthquake Ground Motion on a Microcomputer Near-field Ground Motion from the Landers Earthquake Estimation of Ground Motion Parameters An Empirical Interpretation of the Effects of Topography on Ground Motion of the San Fernando, California, Earthquake, 9 February 1971 Methods for Prediction of Strong Earthquake Ground Motion Source and Effects of Light to Moderate Magnitude Earthquakes Earthquake Data in Engineering Seismology Compilation, Assessment and Expansion of the Strong Earthquake Ground Motion Data Base Proceedings of ATC-35 Seminar on New Developments in Earthquake Ground Motion Estimation and Implications for Engineering Design Practice ... Ground Motions and Soil Liquefaction During Earthquakes Methods for Prediction of Strong Earthquake Ground Motion Development of Earthquake Ground Motion Relations for Puerto Rico [microform] Earthquake Intensity and Related Ground Motion Ground-motion Attenuation and Earthquake Source Scaling in Eastern North America A Stochastic Ground Motion Forecast Model with Geophysical Considerations Site Hazard Analysis Methods with Empirical and Geophysical Ground Motion Models Investigation of Local Geology Effects on Strong Earthquake Ground Motions Research on the Strong Ground Motion in Mexico City During the Earthquake of September 19, 1985 Michoacan-Guerrero, Mexico Earthquake Engineering and Soil Dynamics II Ground Motion Studies Directions in Strong Motion Instrumentation Bibliography for Topical Studies of Ground Motion, Fault Mechanics and Seismic Engineering (January 1977 - September 1979) Fault-Zone Guided Wave, Ground Motion, Landslide and Earthquake Forecast Ground Motion Evaluation Procedures for Performance-based Design Stochastic Model for Earthquake Ground Motion Using Wavelet Packets

Earthquake Ground Motion 2024-03-06 earthquake ground motion is a compilation of ten chapters covering tectonics seismicity site effects tsunamis infrastructure and instrumentation it presents state of the art techniques for retrieving rupture models seismogenic structures and validation of focal mechanisms it also presents macroseismic archiving tools for historical and instrumental earthquakes and the fundamentals of seismic tomography the book describes the site response analysis in 2d and 3d considering topographic and soil structure interactions its incorporation in a seismic hazard analysis and the impact of earthquakes on the cost of reconstruction the final sections are devoted to the genesis of earthquakes tsunamis non seismic tsunamis and the new role of gyroscopes in rotational seismology
Strong Ground Motion Seismology 2013-04-17 this book contains selected papers presented at the nato advanced study institute on strong ground motion seismology held in ankara turkey between june 10 and 21 1985 the strong ground motion resulting from a major earthquake determines the level of the seismic hazard to enable earthquake engineers to assess the structural performance and the consecutive risks to the property and life as well as providing detailed information to seismologists about its source mechanism from the earthquake engineering point the main problem is the specification of a design level ground motion for a given source site structure economic life and risk combination through deterministic and probabilistic approaches in seismology the strong motion data provide the high frequency information to determine the rupture process and the complexity of the source mechanism the effects of the propagation path on the strong ground motion is a research area receiving sub stantial attenuation both from earthquake engineers and seismologists the institute provided a venue for the treatment of the subject matter by a series of lectures on earthquake source models and near field theories effects of propagation paths and site conditions numerical and empirical methods for prediction data acquisition and analysis hazard assessment and engineering application
Ground Motion Seismology 2021-01-04 this book explains the physics behind seismic ground motions and seismic waves to graduate and upper undergraduate students as well as to professionals both seismic ground motions and seismic waves are terms for shaking due to earthquakes but it is common that shaking in the near field of an earthquake source is called seismic ground motion and in the far field is called seismic waves seismic ground motion is often described by the tensor formula based on the representation theorem but in this book explicit formulation is emphasized beginning with augustus edward hough love 1863 1940 the book also explains in depth the equations and methods used for analysis and computation of shaking close to an earthquake source in addition it provides in detail information and knowledge related to teleseismic body waves which are frequently used in the analysis of the source of an earthquake
Earthquake Ground Motion 2014-09-29 the best way to minimize damage from earthquakes is to predict their location and effects and reinforce against those possible effects toward that end this book presents prediction methods useful for the design of earthquake resistant structures in the first of two parts the book deals with issues relating to the characterisation and the rational definition of seismic input it begins with a study of earthquake records that leads to the identification of their damage potential parameters such as the peak ground acceleration and the strong motion duration subsequent chapters concern themselves with the deterministic and probabilistic methodologies for producing seismic inputs further chapters are dedicated to the generation of artificial seismic input on the basis of stochastic or probabilistic approaches the second part of this volume deals with the effects of ground motion on foundation elements and structural integrity particular emphasis is given to the interaction of foundation piles with vibrating soils homogeneous or heterogeneous the final two chapters are concerned with the possible connection between soil structure interaction ssi and structural damage in both instances records of actual earthquake induced motion are used for such assessments

Earthquake Motion and Ground Conditions 1993 despite advances in the field of geotechnical earthquake engineering earthquakes continue to cause loss of life and property in one part of the world or another the third international conference on soil dynamics and earthquake engineering princeton university princeton new jersey usa 22nd to 24th june 1987 provided an opportunity for participants from all over the world to share their expertise to enhance the role of mechanics and other disciplines as they relate to earthquake engineering the edited proceedings of the conference are published in four volumes this volume covers seismicity and tectonics in the eastern mediterranean seismic waves in soils and geophysical methods engineering seismology dynamic methods in soil and rock mechanics and ground motion with its companion volumes it is hoped that it will contribute to the further development of techniques methods and innovative approaches in soil dynamics and earthquake engineering

Ground Motion and Engineering Seismology 2015-08-11 the accelerated and often uncontrolled growth of the cities has contributed to the ecological transformation of their immediate surroundings factors contributing to the urban vulnerability include lowering or rising of the water table subsidence loss of bearing capacity of soil foundations and instability of slopes recent catastrophic earthquakes highlight the poor understanding by decision makers of seismic related risk as well as the tendency of some builders to use the cheapest designs and construction materials to increase short term economic returns on their investment losses from earthquakes will continue to increase if we do not shift towards proactive solution disaster reduction is both an issue for consideration in the sustainable development agenda and a cross cutting issue relating to the social economic environmental and humanitarian sectors as location is the key factor which determines the level of risk associated with a hazard land use plans and mapping should be used as tools to identify the most suitable usage for vulnerable areas

State-of-the-art Study Concerning Near-field Earthquake Ground Motion 1981 for performance based design nonlinear dynamic structural analysis for various types of input ground motions is required stochastic simulated ground motions are sometimes useful as input motions because unlike recorded motions they are not limited in number and because their properties can be varied systematically to study the impact of ground motion properties on structural response this dissertation describes an approach by which the wavelet packet transform can be used to characterize complex time varying earthquake ground motions and it illustrates the potential benefits of such an approach in a variety of earthquake engineering applications the proposed model is based on thr ainsson and kiremidjian 2002 which use fourier amplitudes and phase differences to simulate ground motions and attenuation models to their model parameters we extend their model using wavelet packet transform since it can control the time and frequency characteristic of time series the time and frequency varying properties of real ground motions can be captured using wavelet packets so a model is developed that requires only 13 parameters to describe a given ground motion these 13 parameters are then related to seismological variables such as earthquake magnitude distance and site condition through regression analysis that captures trends in mean values standard deviations and correlations of these parameters observed in a large database of recorded strong ground motions the resulting regression equations then form a model that can be used to predict ground motions for a future earthquake scenario this model is analogous to widely used empirical ground motion prediction models formerly called attenuation models except that this model predicts entire time series rather than only response spectra the ground motions produced using this predictive model are explored in detail and are shown to have elastic response spectra inelastic response spectra durations mean periods etc that are consistent in both mean and variability to existing published predictive models for those properties that consistency allows the proposed model to be used in place of existing models for probabilistic seismic hazard analysis psha calculations this new way to calculate psha is termed simulation based probabilistic seismic

hazard analysis and it allows a deeper understanding of ground motion hazard and hazard deaggregation than is possible with traditional psha because it produces a suite of potential ground motion time histories rather than simply a distribution of response spectra the potential benefits of this approach are demonstrated and explored in detail taking this analysis even further this suite of time histories can be used as input for nonlinear dynamic analysis of structures to perform a risk analysis i e probabilistic seismic demand analysis that allows computation of the probability of the structure exceeding some level of response in a future earthquake these risk calculations are often performed today using small sets of scaled recorded ground motions but that approach requires a variety of assumptions regarding important properties of ground motions the impacts of ground motion scaling etc the approach proposed here facilitates examination of those assumptions and provides a variety of other relevant information not obtainable by that traditional approach

Seismic Ground Motion in Large Urban Areas 2012-12-06 this study attempts to determine site effects on earthquake ground motion and the correlation between acceleration and or velocity generated during the san fernando earthquake and topography of the san gabriel mountain range it was found that the contours of peak acceleration and peak velocity generally follow the topography of the san gabriel mountain range the topographical effects on the ground motion could be interpreted in a simple manner as a function of elevation and direction of wave transmission path the elevation and direction become the dominant factors in the distribution of the ground motion in the near field a simple practical method for calculating the bedrock motion using the ground motion elevation gradient has been applied in the area south of kagel mountain and north of santa monica mountain in the san fernando valley this method is validated using after shock data this ground motion elevation gradient method was applied to an area where the topography has its highest elevation at the epicentral region and decreases in elevation to the surrounding locations in the near field within 30 km in any case when the epicenter occurs at an elevation lower than the elevation of the surrounding area this gradient method may not be applicable and must be tested for this alternate condition

Strong Ground Motion 1978 this book addresses current activities in strong motion networks around the globe covering issues related to designing maintaining and disseminating information from these arrays the book is divided into three principal sections the first section includes recent developments in regional and global ground motion predictive models it presents discussions on the similarities and differences of ground motion estimations from these models and their application to design spectra as well as other novel procedures for predicting engineering parameters in seismic regions with sparse data the second section introduces topics about the particular methodologies being implemented in the recently established global and regional strong motion databanks in europe to maintain and disseminate the archived accelerometric data the final section describes major strong motion arrays around the world and their historical developments the last three chapters of this section introduce projects carried out within the context of arrays deployed for seismic risk studies in metropolitan areas audience this timely book will be of particular interest for researchers who use accelerometric data extensively to conduct studies in earthquake engineering and engineering seismology

Stochastic Model for Earthquake Ground Motion Using Wavelet Packets 2011 analyses ground motion data taken at three sites in mexico and compares accelerograms recorded in mexico and japan

Earthquake Ground Motion and Its Effects on Structures 1982 strong ground motion measuring and recording instruments play a major role in mitigation of seismic risk the strong ground motion near the source of an earthquake describes the effects that endanger our built environment and is also the most detailed clue concerning the source mechanism of the earthquake the range of complexity that engulfs our understanding of the source parameters of a major earthquake extent of the source

mechanism stress drop wave propagation patterns and how buildings and other works of construction respond to ground transmitted dynamic effects may be overpowered by improved direct observations strong motion seismographs provide the information that enables scientists and engineers to resolve the many issues that are intertwined with practical problems of building safe communities worldwide they may be installed as arrays close to major fault zones consisting of many instruments arranged in some geometrical pattern or in the vicinity and mounted on buildings this book which contains papers by invited authorities represents a unique interaction between seismologists and earthquake engineers who examine issues of mutual concern in an overlapping area of major interest the papers have been grouped around three major areas seismic hazard and extreme motions engineering uses of strong motion seismograms arrays and observations

Procedures for Estimating Earthquake Ground Motions 1980 the book covers multi disciplinary topics in observational computational and applied geophysics in aspects of solid earth system the authors provide an up to date overview for methods and techniques in seismology with a focus on fault structure strong ground motion and earthquake forecast based on full 3d earth structure models abundant of case studies make it a practical reference for researchers in seismology and applied geophysics

Influence of Local Geology on Earthquake Ground Motion 1969 for performance based design nonlinear dynamic structural analysis for various types of input ground motions is required stochastic simulated ground motions are sometimes useful as input motions because unlike recorded motions they are not limited in number and because their properties can be varied systematically to study the impact of ground motion properties on structural response this dissertation describes an approach by which the wavelet packet transform can be used to characterize complex time varying earthquake ground motions and it illustrates the potential benefits of such an approach in a variety of earthquake engineering applications the proposed model is based on thráinsson and kiremidjian 2002 which use fourier amplitudes and phase differences to simulate ground motions and attenuation models to their model parameters we extend their model using wavelet packet transform since it can control the time and frequency characteristic of time series the time and frequency varying properties of real ground motions can be captured using wavelet packets so a model is developed that requires only 13 parameters to describe a given ground motion these 13 parameters are then related to seismological variables such as earthquake magnitude distance and site condition through regression analysis that captures trends in mean values standard deviations and correlations of these parameters observed in a large database of recorded strong ground motions the resulting regression equations then form a model that can be used to predict ground motions for a future earthquake scenario this model is analogous to widely used empirical ground motion prediction models formerly called attenuation models except that this model predicts entire time series rather than only response spectra the ground motions produced using this predictive model are explored in detail and are shown to have elastic response spectra inelastic response spectra durations mean periods etc that are consistent in both mean and variability to existing published predictive models for those properties that consistency allows the proposed model to be used in place of existing models for probabilistic seismic hazard analysis psha calculations this new way to calculate psha is termed simulation based probabilistic seismic hazard analysis and it allows a deeper understanding of ground motion hazard and hazard deaggregation than is possible with traditional psha because it produces a suite of potential ground motion time histories rather than simply a distribution of response spectra the potential benefits of this approach are demonstrated and explored in detail taking this analysis even further this suite of time histories can be used as input for nonlinear dynamic analysis of structures to perform a risk analysis i e probabilistic seismic demand analysis that allows computation of the probability of the structure exceeding some level of response in a future earthquake these risk calculations are often performed today using small sets of scaled

recorded ground motions but that approach requires a variety of assumptions regarding important properties of ground motions the impacts of ground motion scaling etc the approach proposed here facilitates examination of those assumptions and provides a variety of other relevant information not obtainable by that traditional approach

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