



# **Blast Vibration Analysis**

G. A. Bollinger

Southern Illinois University Press

# Blast Vibration Analysis

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## **Blast Vibration Analysis:**

**Blast Vibration Analysis** G. A. Bollinger, 1980 An aid to those who make and interpret blast vibration measurements this book serves as an especially useful and timely introduction Wave phenomena are a familiar part of everyone's experience Water waves are perhaps the most graphic but the existence of sound waves light waves and electromagnetic radio and television waves is also well known The destructive effect of earthquake waves receives widespread publicity It is thus obvious that gases liquids and solids will support wave motion For the understanding and analysis of blast vibrations scientists and engineers require a sophisticated understanding of wave phenomena G A Bollinger in *Blast Vibration Analysis* makes an important contribution to this study focusing on the origin transmission and types of elastic wave in solid media The physical laws involved in waves analysis as well as the mathematical tools needed to specify and analyze the variety of wave phenomena encountered in nature are also provided Mr Bollinger synthesizes the theory and literature from the seismological geophysical and engineering disciplines pertinent to the subject area of blast vibrations induced by quarrying mining and engineering operations While the theory and analytical techniques presented do apply to vibrations from earthquakes and nuclear explosions the author avoids developing a specific consideration of those latter phenomena However he applies the analytical tools that have been so highly refined in earthquake engineering earthquake seismology and seismic exploration for petroleum i.e digital and spectral analyses to the blast vibration problem Dividing his book into five textual chapters Mr Bollinger devotes the first two to a detailed consideration of seismic waves both from a general physical viewpoint as well as from the effects of blasting The third chapter covers the mathematical theory of the seismograph along with examples of instruments currently used by professionals A very specific discussion of the analysis of blast vibrations including steady state suddenly beginning digital and trace matching analyses is presented in the fourth chapter The concluding chapter considers damage criteria both American and European along with the structural and physiological effects of blast vibrations Mr Bollinger's skillful exposition of each of these topics starts at an elementary level assuming some college engineering or scientific background proceeds to an intermediate stage and then suggests directions for more advanced study While the theoretical presentation is kept general specific examples and certain relevant points are made with reference to Sprengnether seismic instruments Each chapter is followed by a list of references and a bibliography of the field of engineering seismology as a whole appears at the back of the book Numerous informative tables figures graphs charts mathematical examples and photographs of instruments are included in the body of the text Scientific students and professionals will find Mr Bollinger's book stimulating and suggestive of further ranges of study and practice [Blast Vibration Analysis with a Two-support, Two-degree of Freedom System](#) Hiroaki Todo, 1982 **Blast vibration analysis, interpretation and prediction**, 1986 **Vibrations from Blasting** Alex Spathis, Mike J. Noy, 2009-08-20 Collection of excellent articles presenting the latest developments in blast vibration measurements modeling and mitigation techniques

Includes contributions on novel environmentally induced vs blast induced movements non conventional geophysical processing techniques new modeling approaches mitigation techniques using smarter blasting methods Near-field Blast Vibration Monitoring and Analysis for Prediction of Blast Damage in Sublevel Open Stopping Kelly Gene Fleetwood,2010 The work presented in this thesis investigates near field blast vibration monitoring analysis interpretation and blast damage prediction in sublevel open stopping geometries As part of the investigation seven stopes at two Australian sublevel open stopping mines were used as case studies The seven stopes represented significant ranges in stope shapes sizes geotechnical concerns extraction sequences stress conditions blasting geometries and rock mass properties **Suggested Method for Blast Vibration Monitoring** ,1992 Blast Vibration Monitoring and Control C. H. Dowding,1985 **Rock Fragmentation by Blasting** Jose A. Sanchidrian,2009-08-20 This volume contains the papers presented at the 9th International Symposium on Rock Fragmentation by Blasting held in Granada Spain 13 17 August 2009 A state of the art collection of articles on developments in rock blasting and explosives engineering with contributions on rock characterization explosives and initiation systems blast design and monitoring fragmentation assessment numerical modeling vibrations from blasting environmental and economical aspects of rock blasting and more Containing unique knowledge case studies ideas and insights this volume is must have literature for researchers and practitioners in the field of explosives and blasting

*Rock Mechanics in Underground Construction* C. F. Leung,Yingxin Zhou,2006 This proceedings volume contains over 300 papers on rock mechanics and engineering with contributors from all over Asia and many other parts of the world Seven keynote papers summarize the state of the art in rock engineering including topics such as underground rock caverns The technical papers cover a wide range of rock mechanics and engineering topics rock tunnels caverns mining rock slopes and dams rock blasting rock burst and failure rock properties rock mass rock joints and block theory Numerous valuable rock engineering case studies are also reported This volume should serve as a useful reference for the engineers and researchers in rock mechanics and rock engineering Sample Chapter s Chapter 1 Forensic Engineering for Underground Construction 244 KB Contents Tunnelling Rock Caverns Mining Blasting and Dynamics Support and Reinforcement Rock Mass Rock Properties Discontinuities Block Theory and DDA Failure Fracture and Burst Dams and Slopes Other Applications Readership Graduate students academics and researchers in civil engineering and engineering mechanics *Vibrations from Blasting* Alex Spathis, Mike J. Noy,2009-08-20 Collection of excellent articles presenting the latest developments in blast vibration measurements modeling and mitigation techniques Includes contributions on novel environmentally induced vs blast induced movements non conventional geophysical processing techniques new modeling approaches mitigation techniques using smarter blasting methods **Blast Vibration Monitoring and Analysis at the Three Mile Hill Project** Cullum P. Winn,1993 **Monitoring, early warning and mitigation of natural and engineered slopes - volume II** ,2023-05-16 Monitoring, Early Warning and Mitigation of Natural and Engineered Slopes, volume IV Wen Nie, Haijun Qiu,Afshin

Asadi,2025-05-27 Natural and engineered slopes are widely distributed worldwide including mountain slopes highway slopes mine slopes reservoir dams etc These slopes could become unstable due to natural factors or human activities causing catastrophic loss of life and infrastructure destruction Therefore these slopes require constant monitoring to provide early warning and enable mitigation Advanced monitoring equipment information technology and multidisciplinary interaction theories have created new opportunities and challenges in this discipline Recently advanced monitoring devices information technologies and multidisciplinary intersection theories have contributed to the monitoring early warning and mitigation of natural and engineered slopes However effective and efficient monitoring precise early warning low cost and low timeconsuming remediation and reliable risk assessment remain obstacles This Research Topic aims to present the most recent innovative advancements and state of the art natural and engineered slope monitoring early warning mitigation and risk assessment

**Experimental and Analytical Analysis of Blasting Criteria** Glenn A. Hazen,1991 *Blast Vibration Monitoring and Control* Charles H. Dowding,1985 [Ground Vibration Monitoring for Construction Blasting in Urban Areas](#),2000 This study addresses the need to update the California Department of Transportation Caltrans standards related to vibration monitoring programs and equipment acceptable tolerances for vibrations for various classes of urban structures and the recommended limits for pre blast damage surveys The area confined within a pre construction and post construction survey covers a region in which vibrations have the potential to cause structural damage as well as perceived damage from residents The study first discusses the origin of Caltrans vibration specifications Instrumentation used in the study is described Actual field vibrations from 27 rock blasts which occurred on the Route 54 project in San Diego County with observations recorded for vibration measurements are documented The study concludes that future research into setting pre blast survey radius limits is justified as this would lead to considerable savings

**Analysis of Blast-induced Underground Vibrations from Surface Mining** Yung-Kwaun Jow,University of Alabama. Graduate School. Department of Civil Engineering,1983

**Proceedings of the 2024 3rd International Conference on Structural Seismic Resistance, Monitoring and Detection (SSRMD 2024)** Abhijit Mohanrao Zende,Yongding Tian,Lingkun Chen,Saeed Ghaffarpour Jahromi,2024-04-26 This is an open access book With the deepening of urbanization there are more and more buildings in the city The buildings are also gradually diversifying and becoming more complex However while the aesthetics of the building are improved the safety of the building also needs to be fully guaranteed Whether it is the influence of natural disasters or human factors it may lead to damage to building structures Therefore the structure in civil buildings is earthquake resistant and the problems of disaster prevention and mitigation are emerging in an endless stream and they need to be solved urgently In order to solve the above problems more and more experts and scholars have conducted in depth research in this field and various seismic resistance in the field of civil engineering and construction new theories of monitoring and testing new technologies and new products have emerged and academic exchanges in this field have become increasingly active

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*Rock Dynamics: Progress and Prospect, Volume 2* Jianchun Li, Xiaozhao Li, Minghe Ju, Fengqiang Gong, Yingxin Zhou, 2023-05-28. Rock Dynamics Progress and Prospect contains 153 scientific and technical papers presented at the Fourth International Conference on Rock Dynamics and Applications RocDyn 4, Xuzhou, China, 17-19 August 2022. The two-volume set has 7 sections. Volume 1 includes the first four sections with 6 keynotes and 5 young scholar plenary session papers and contributions on analysis and theoretical development and experimental testing and techniques. Volume 2 contains the remaining three sections with 74 papers on numerical modelling and methods, seismic and earthquake engineering, and rock excavation and engineering. Rock Dynamics Progress and Prospect will serve as a reference on developments in rock dynamics scientific research and on rock dynamics engineering applications. The previous volumes in this series, RocDyn 1, RocDyn 2, and RocDyn 3, are also available via CRC Press.

*Structure Response and Damage Produced by Ground Vibration from Surface Mine Blasting* United States. Bureau of Mines, 1980.

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