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Proceedings of ASMA-2021 (Volume 3)

Editors: José António Fonseca de Oliveira Correia,

Satyabrata Choudhury, Subhrajit Dutta

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## Sections

Table of contents

Other volumes

About this book

<u>Keywords</u>

Editors and Affiliations

**Bibliographic Information** 

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earch within bo	ok	_
- Previous	Page 2 of 2 Next →	
	of Hot Air Exposure on CFRP	
	ngthened RC T-Beams	
Franklin F. R. I Pages 257-27	rederick, U. K. Sharma, V. K. Gupta 1	
<u>Mathemati</u>	cal Models for Seismic Analy	<u>sis</u>
of Elevated	Water Tanks: A Review	
Kangkana K. E Pages 272-28	aruah, Satyabrata Choudhury 1	
<u>Seismic Vu</u>	Inerability Assessment Metho	ods
<u>A Review</u>		
N. Sarma Roy, Pages 282-30	Satyabrata Choudhury	
	ent in Direct Displacement-	
Based Desi	gn: A Review	
Based Desi	gn: A Review atyabrata Choudhury	
Based Desi Manish Pal, Sa Pages 301-32	gn: A Review atyabrata Choudhury	
Based Desi Manish Pal, Sa Pages 301-32 Study on H	gn: A Review atyabrata Choudhury 4	
Based Desi Manish Pal, Sa Pages 301-32 Study on H	gn: A Review atyabrata Choudhury 4 ligh Strength Concrete with mbination of Steel and	

### Response of T-shaped Tall Building Under Wind Load

P. G. Priyadarsh, Neelam Rani Pages 336-343

Source Localization in a Framed Structure for Effective Damage Detection Using Acoustic Emission Technique

Anupam Kumar Biswas, Aloke Kumar Datta, Pijush Topdar, Sanjay Sengupta Pages 344-352

Study on Evaluation of Angle Connection for Transmission Towers

Vinay Kumar Singh, Abhishek Kumar Gautam Pages 353-363

Performance-Based Seismic Design on Bridge Piers: A Review

Gaddam Sudheer, Satyabrata Choudhury Pages 364-372

<u>Vibration and Stability Characteristics of the</u> <u>Laminated Composite Plates (LCPs) for</u> Various Delamination Positions

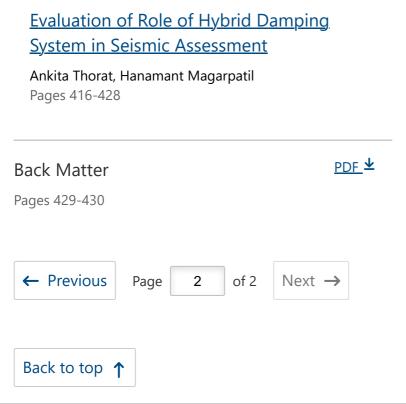
H. S. Rakshith, L. Ravi Kumar, D. L. Prabhakara, T. Rajanna Pages 373-389

<u>Strengthening of Distressed Reinforced</u> <u>Concrete Structural Member by Use of FRP</u> <u>Composites: A Review</u>

Nitesh Kumar, H. K. Sharma Pages 390-403

## Performance-Based Seismic Design: A Review

Shruti Chaudhary, Satyabrata Choudhury Pages 404-415



# Other Volumes

- 1. <u>Advances in Structural Mechanics and</u> <u>Applications</u>
- 2. <u>Advances in Structural Mechanics and</u> <u>Applications</u>
- 3. Advances in Structural Mechanics and Applications

Back to top **↑** 

# About this book

The proceedings of the conference is going to benefit the researchers, academicians, students and professionals in getting enlightened on latest technologies on structural mechanics, structure and infrastructure engineering. Further, work on practical applications of developed scientific methodologies to civil structural engineering will make the proceedings more interesting and useful to practicing engineers and structural designers.

Back to top **↑** 

# Keywords

**Structural Mechanics** 

**Sustainable and Resilient Structures** 

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**Fluid-Structure Interaction** 

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Back to top 1

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Back to top **↑** 

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Source Localization in a Framed Structure for Effective Damage Detection Using Acoustic Emission Technique

<u>Anupam Kumar Biswas</u> <sup>⊡</sup>, <u>Aloke Kumar Datta</u>, <u>Pijush</u> <u>Topdar</u> & <u>Sanjay Sengupta</u>

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## Abstract

Acoustic Emission (AE) technique is capable of detecting real time small-scale damage long before failure in a structure. However, the placement of sensors in a framed structure is an important issue for effective damage detection, which remains a challenge for many researchers. In this study, an experimental investigation is carried out for the localization of mounted AE sensors on a prototype rigid framed structure, and by detecting simulated AE source using Pencil Lead Break (PLB), on 12/3/22, 2:24 PM

different beam and column locations of each floor levels of the framed structure. Then with the recorded AE signal waveforms, frequency analyses have been performed using the wavelet transform to get the signal's energy concentration. To localize the damage the wavelet transform is used in the time-frequency domain along with the group velocity. From the data comparison and analysis, it is found that for effective damage detection a single AE sensor can to be placed at the beamcolumn joints of each floor level of framed structure on every plane of the frame.

Keywords

Acoustic emission technique

Structural health monitoring

Wavelet transformation

Hsu-Nielsen pencil lead break

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