# International Conference VIBROENGINEERING

Nanjing, China September 26-28, 2015



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## 19th VIBROENGINEERING 2015:

# International Conference on Vibration Science of Infrastructure Engineering

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Committee of Structural Control and Monitoring Chinese Society for Vibration Engineering

Jiangsu's Co-Innovation Center for Saftey of Critical Civil Infrastructure

Co-Organizers:

College of Mechanics and Materials, Hohai University Tianjin Society of Theoretical and Applied Mechanics
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The 19th International Conference on Vibration Science of Infrastructure Engineering September 26-28th 2015 Nanjing, China

**Conference Contacts:** 

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The 19<sup>th</sup> VIBROENGINEERING 2015: International Conference on Vibration Science of Infrastructure Engineering will be held during 26-28th of September, 2015 in Nanjing, China. Its purpose is to provide a platform for scientists, engineers and practitioners throughout the world to exchange ideas and present their latest research results in the areas of infrastructure engineering, typically bridge engineering, hydraulic engineering, offshore engineering, and transportation structures. The conference is sponsored by Hohai University, Jiangsu's Co-Innovation Center for Safety of Critical Civil Infrastructure, Committee of Structural Control and Monitoring, Chinese Society for Vibration Engineering, co-organized by JVE International, College of Mechanics and Materials at Hohai University, and supported by Jiangsu Society of Theoretical and Applied Mechanics, National Science Foundation Committee of China, Beijing Society of Theoretical and Applied Mechanics, Tianjin Society of Theoretical and Applied Mechanics, College of Civil and Transportation Engineering at Hohai University, and Beihang University.

The main theme of the conference will be Vibration Theories, Approaches and Technologies in Infrastructure Engineering. This conference covers a range of topics, including but not limited to:

Modelling & Simulation in Vibroengineering Spectral analysis Nonlinear vibration problems Vibration damage diagnosis Vibration Coupling & Interaction Modal Analysis & Identification Noise & Uncertainty & Control

All accepted papers intend to address the hottest issues in Vibroengineering of dynamical systems and will be published in JVE PROCEDIA. The extended excellent papers will be published in Journal of Vibroengineering.

The program of the conference is arranged into one Invited Speakers Session at Hohai University and Symposium Sessions at Xikang Hotel, Nanjing, Jiangsu province, China.

On behalf of the Organizing Committee, we would like to welcome the delegates to International Conference VIBROENGINEERING 2015. We hope that you will enjoy the conference and find VIBROENGINEERING 2015 Program exciting. We look forward to meeting you in September 2015, Nanjing.





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- M. Zakrzhevsky, Riga Technical University, Latvia





# **Conference Program**

Day 1: September 26	Location: Room 108, Wentian Building, Hohai University

	PLENARY SESSION Chairs Maosen Cao and Minvydas Ragulskis
08:00-08:15	OPENING CEREMONY Prof. Hongwu Tang, Vice President, Hohai University Prof. Jinping Ou, President of Chinese Society of Vibration Engineering Prof. Minvydas Ragulskis, Editor-in-Chief of Journal of Vibroengineering
08:15-08:30	Photo Session
08:30-09:00	Plenary Speech: Prof. <b>Jinping Ou</b> , Harbin Institute of Technology; Dalian University of Technology Structural Vibration Control of Civil Infrastructure: Advances, Challenges and Prospects
09:00-09:30	Plenary Speech: Prof. <b>Weixin Ren</b> , Hefei University of Technology Structural Damage Detection by Using Wavelet Packet Transform
09:30-10:00	Plenary Speech: Prof. <b>Li Cheng</b> , The Hong Kong Polytechnic University A Pseudo-Excitation Approach for Structural Damage Detection

10:00-10:15	Coffee Break
10:15-10:45	Plenary Speech: Prof. <b>Hongnan Li</b> , Dalian University of Technology Studies and Implementations of Vibration Reduction Techniques for Civil Engineering
10:45-11:15	Plenary Speech: Prof. <b>Feng Jin</b> , Tsinghua University Study on the Vibration Control of Structures based on Real-Time Hybrid Simulation





11:15-11:45	Plenary Speech: Prof. <b>Minvydas Ragulskis</b> , Kaunas University of Technology Dynamic Visual Cryptography - Problems and Applications
11:45-12:15	Plenary Speech: Prof. <b>Qiusheng Li</b> , City University of Hong Kong Monitoring and Simulation of Wind Effects on Buildings

12:15-14:00	Lunch
14:00-14:30	Plenary Speech: Prof. <b>Hui Li</b> , Harbin Institute of Technology Control for vibration of long-span bridges
14:30-15:00	Plenary Speech: Prof. <b>Yufeng Gao</b> , Hohai University Scattering of Seismic SH waves by a U-shaped Canyon
15:00-15:30	Plenary Speech: Prof. <b>Gangbing Song</b> , University of Houston Pounding Tuned Mass Damper (PTMD) – A New Passive Device for Vibration Control
15:30-16:00	Plenary Speech: Prof. <b>Hoon Sohn</b> , Korea Advanced Institute of Science and Technology Nonlinear ultrasonic modulation for damage detection
16:00-16:30	Plenary Speech: Prof. <b>Maosen Cao</b> , Hohai University Evaluation of High-order Modes of Euler- and Timoshenko-Beams
16:30-16:45	Coffee Break





Day 1: September 26 Location: Building 6, Xikang Hotel (Room #1)

	PARALLEL ORAL SESSION 1 "Dynamics & Vibrations and Applications"
	Session Chair Prof. Lui Li
16:45-17:00	Guang-Qing Lu. Jinan University.
	Investigation on Dynamic Characteristics of Mechanical Assembly.
17:00-17:15	Yang Xin. University of Science and Technology of China, Hefei.
	A research on the dynamic characteristics of axially moving beam under
	thermal shock.
17:15-17:30	Fei Wang. Nanjing University of Aeronautics and Astronautics.
	A comparison study on application of model reduction methods in
	rotordynamics.
17:30-17:45	Xin Zhang. Mechanical Engineering College, Shijiazhuang.
	Planetary gearboxes performance degradation analysis and prediction.
17:45-18:00	Ting Jin. Nanjing University of Aeronautics and Astronautics. Research on the
	technology of sealing disk-baffle integrated structure design.

Day 1: September 26 Location: Building 6, Xikang Hotel (Room #2)

	PARALLEL ORAL SESSION 2 "Vibration-based Diagnosis"
	Session Chair Prof. Feng Jin
16:45-17:00	Jun-Bo Su. Naval University of Engineering, Wuhan.
	Sensor placement in the noise source identification based on acoustic radiation
	modes.
17:00-17:15	Wei-Li Qin. Beihang University, Beijing.
	Rolling bearing fault diagnosis based on ensemble empirical mode
	decomposition, information entropy and random forests.
17:15-17:30	Yu-Ling He. North China Electric Power University, Baoding.
	Stator vibration of generator under SAERISC faults.
17:30-17:45	Zhou Bo. Beihang University, Beijing.
	Fault diagnosis of rolling bearing with incomplete labels using weakly labeled
	support vector machine.
17:45-18:00	Li Yuan. Tianjin University.
	Review of Damage Problems of the Soft Substrate Interlayer Film.

Day 1: September 26

18:30-21:00	GALA DINNER
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Day 2: September 27 Location: Building 6, Xikang Hotel (Room #1)

	PARALLEL ORAL SESSION 3 "Dynamics & Vibrations and Applications"
	Session Chair Prof. Hongnan Li
08:00-08:15	Qing Li. Nanjing University of Aeronautics and Astronautics. Differences of
	dynamic behaviors of face gear drives between time varying and average mesh
	stiffness.
08:15-08:30	Zhengmin Li. Naval University of Engineering, Wuhan.
	Study of the influence of the resonance changer on the longitudinal vibration of
	marine propulsion shafting system.
08:30-08:45	Zhen Li. Nanjing University of Science and Technology.
	Simulation of Engraving Process of Large-caliber Artillery Using Coupled
	Eulerian-Lagrangian Method.
08:45-09:00	Xia Xiaojun. Chongqing University.
	Application of wave based method for predicting the response of coupled vibro-
	acoustic system with unconstrained damping layer.
09:00-09:15	Cheng Guo. Naval University of Engineering, Wuhan. Application and
	measurement of underwater acoustic reciprocity transfer functions with impulse
	sound sources.
09:15-09:30	Shengli Li. Zhengzhou University. Aerodynamic performance analysis of wind-
	sand flow on suspension bridge suspender cables.

Day 2: September 27 Location: Building 6, Xikang Hotel (Room #2)

	PARALLEL ORAL SESSION 4 "Vibration-based Diagnosis"
	Session Chair Prof. Minvydas Ragulskis
08:00-08:15	Lianfeng Li. Beihang University, Beijing.
	Rolling bearing fault diagnosis using improved LCD-TEO and softmax classifier.
08:15-08:30	Shu Li. Chongqing University.
	The source localization technique based on improved functional beamforming
	using a virtual array.
08:30-08:45	Lei Qiu. Nanjing University of Aeronautics and Astronautics.
	A new damage imaging method based on Lamb wave wavenumber response
	and PZT 2D cross-shaped array.
08:45-09:00	Wanlin Zhao. Beihang University, Beijing.
	A Deep Learning Method using SDA Combined with Dropout for Bearing Fault
	Diagnosis.
09:00-09:15	Hao Long. Chinese Academy of Sciences, Beijing.
	Experimental research on dynamic characteristics of gas bearing-rotor with
	different radial clearances.





09:15-09:30	Zhi-Kai Fu. PLA University of Science and Technology, Nanjing. Simulation
	of ultrasonic SAFT imaging on concrete block using mobile PML absorbing
	boundary.

Day 2: September 27 Location: Building 6, Xikang Hotel (Room #3)

	PARALLEL ORAL SESSION 5 "Vibrations, nonlinear dynamics and applications"	
	Session Chair Prof. Maosen Cao	
08:00-08:15	Fucheng Sun. Mechanical Engineering College, Shijiazhuang. Gearbox fault	
	diagnosis based on autocorrelation and HHT.	
08:15-08:30	Jian Xu. China Academy of Engineering Physics, Mianyang.	
	A New Machinery Diagnosis Method Based on Complex Bilateral Spectrum.	
08:30-08:45	Piangpen Puasopis. Defence Technology Institute, Nonthaburi. Comparative	
	Blast Study of Simulation and Approximation Method of Armored Vehicles.	
08:45-09:00	Huimin Xu. North China Electric Power University, Beijing.	
	An active control scheme for rotor vibration based on predictive variable	
	learning gain.	
09:00-09:15	Di Liu. Shangqiu Normal University, Shangqiu.	
	Study on damage identification of earthquake damaged structures based on	
	unsupervised learning method.	
09:15-09:30	Parkpoom Chokchairungroj. Defense Technology Institute, Nonthaburi.	
	Modeling and Control of a Demonstrative prototype for platform Multi-	
	Launcher Rocket System using Lagrange's Equation.	

## Day 2: September 27

09:30-09:45	Coffee Break

Day 2: September 27 Location: Building 6, Xikang Hotel (Room #1)

	PARALLEL ORAL SESSION 6 "Vibration in Transportation Engineering"
	Session Chair Prof. Maosen Cao
09:45-10:00	Huile Li. Beijing Jiaotong University.
	Integrating a verified vehicle-bridge system model into fatigue assessment of
	steel railway bridge.
10:00-10:15	Z.W. Wu. Sun Yat-sen University, Guangzhou.
	Simplified computational method for mooring forces of mooring systems.
10:15-10:30	Yujing Wang. Beijing Jiaotong University.
	Numerical analysis of aerodynamic features of porosity-optimized wind barriers
	and running safety of train.
10:30-10:45	Hongchao Ma. Nanjing Forestry University. The stablity of the tethered trailer
	and its control.





10:45-11:00	Weihua Ma. Southwest Jiaotong University, Sichuan.
	Impact analysis of lateral damper on the ride quality of metro vehicle.
11:00-11:15	Chaoyi Xia. Beijing Jiaotong University.
	Dynamic analysis of a train-bridge system to vessel collision and running safety
	of high-speed trains.
11:15-11:30	H.L. Li. Sun Yat-sen University, Guangzhou.
	Identification of Moving Vehicular Parameters Based on Glowworm Swarm
	Optimization Algorithm.
11:30-11:45	Linlin Du. Beijing Jiaotong University.
	Study on wheel-rail interaction based on rail roughness.
11:45-12:00	Jeng-Hsiang Lin. Hwa Hsia University of Technology, New Taipei City.
	Simulation of dynamic vehicle load on road pavement.

Day 2: September 27 Location: Building 6, Xikang Hotel (Room #2)

	PARALLEL ORAL SESSION 7 "Vibration-based Diagnosis"
	Session Chair Prof. Qiusheng Li
09:45-10:00	Yang Wang. Beihang University, Beijing.
	A Centrifugal pump fault diagnosis approach Based on LCD-ApEn and PNN.
10:00-10:15	Meng Ma. China Academy of Railway Science, Beijing. Analysis of the
	dynamic stiffness and bearing capacity for pile foundations.
10:15-10:30	Hongli Gao. Southwest Jiaotong University, Chengdu.
	Screw Lifetime Prediction Based on Wavelet Neural Network and Empirical
	Mode Decomposition.
10:30-10:45	Jin Mao. Chongqing University.
	The improved method of coherent sources with double layers.
10:45-11:00	Wang Xinyue. Southeast University, Nanjing.
	Adaptive algorithm with variable step size for numerical analysis on nonlinear
	fatigue damage accumulation of steel bridge.
11:00-11:15	Zhifang Zhang. Guangzhou University.
	Assessment of delaminations in composite beams using experimental
	frequencies.
11:15-11:30	Xianglong Ni. Mechanical Engineering College, Shijiazhuang. Planetary
	Gearbox Remaining Useful Life Estimation Based on State Space Model.
11:30-11:45	Jiayu Chen. Beihang University, Beijing. Bearing fault diagnosis based on
	active learning and random forest.
11:45-12:00	Ruifeng Yang. Mechanical Engineering College, Shijiazhuang. Preventive
	maintenance optimization policy based on a three-stage failure process in finite
	time horizon.





Day 2: September 27	Location: Building 6, Xikang Hotel (Room #3)
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	PARALLEL ORAL SESSION 8 "Vibration theories and applications"
	Session Chair Prof. Minvydas Ragulskis
09:45-10:00	Fucheng Sun. Mechanical Engineering College, Shijiazhuang. Gearbox fault
	diagnosis based on autocorrelation and HHT.
10:00-10:15	Deli Peng. Dalian University of Technology.
	Smartphone based public participant emergency rescue information platform for
	earthquake zone-"E-Explorer."
10:15-10:30	Yang Jia-Xuan. Naval University of Engineering, Wuhan.
	Application review on underwater radiated noise measurement by using a
	vessel's own towed array.
10:30-10:45	Ouyang Ke-Jian. State Grid Hunan Electric Power Corporation Research
	Institute, Changsha. Design verification of stress and sag for 500 kV
	transmission line.
10:45-11:00	Qian Peng-Bo. Nanjing University of Science and Technology. Reduced order
	modeling for elastic-plastic transient analysis with component mode synthesis.
11:00-11:15	Xuejun Zhu. Yanshan University, Qinhuangdao. Forced vibration frequency
	response for a permanent magnetic planetary gear.
11:15-11:30	Di Wang. Nanjing University of Aeronautics and Astronautics. Vibration
	characteristics analysis of a centrifugal impeller.
11:30-11:45	Chaowei Li. Northwest Institute of Mechanical and Electrical Engineering.
	Technology of high-speed storage for target signal based on ARM7 +double
	NAND memory.
11:45-12:00	Vincentas Veikutis. Lithuanian University of Health Sciences. Destructive
	energy impact to the myocard damage: between technological advantages and
	risk.

	12:00-14:00	Lunch
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Day 2: September 27 Location: Building 6, Xikang Hotel (Room #1)

	PARALLEL ORAL SESSION 9 "Vibration-based Diagnosis"
	Session Chair Prof. Weixin Ren
14:00-14:15	Zihan Chen. Beihang University, Beijing.
	Hydraulic pump fault diagnosis with compressed signals based on stagewise
	orthogonal matching pursuit.
14:15-14:30	Shaoyu Song. Chongqing University.
	The source localization technique based on improved functional beamforming
	using a virtual array.





14:30-14:45	Z. C. Ding. Hohai University, Nanjing.
	Damage identification using singular value feature of continuous wavelet coefficients.
14:45-15:00	Jun-bo Su. Naval University of Engineering, Wuhan.
	Sensor placement in the noise source identification based on acoustic radiation
	modes.
15:00-15:15	W. Xu. Hohai University, Nanjing.
	Multiple damage detection in beams in noisy conditions using complex-wavelet
	modal curvature by laser measurement.
15:15-15:30	Shang Gao. Nanjing University of Aeronautics and Astronautics.
	A high-throughput WSN for structural health monitoring.

Day 2: September 27 Location: Building 6, Xikang Hotel (Room #2)

	PARALLEL ORAL SESSION 10 "Vibrations, nonlinear dynamics and applications"
	Session Chair Prof. Vincentas Veikutis
14:00-14:15	Sergio Daniel Roa Melo. Universidad de los Andes, Bogota.
	An Experimental Methodology for Evaluating the Energy Cost and Comfort
	during Cycling: a Case Study for Analyzing Tire Pressure Influence.
14:15-14:30	<b>Ren Yanrong</b> . Beijing University of Civil Engineering and Architecture. The
	untrenched pipe's stability analysis on the seabed under wave loadings using
	dynamic method.
14:30-14:45	Wen Hsiang Hsieh. National Formosa University, Yunlin, Taiwan. Frictional
	analysis of cam-controlled planetary gear trains.
14:45-15:00	Zhenfa Wang. China Jiliang University, Hangzhou.
	Vortex signal detection method with stochastic resonance based on adaptive
	coupled feedback control.
15:00-15:15	Guo Liang. Naval University of Engineering, Wuhan.
	Double-layer Patch Technique by using Acoustic Radiation Modes.
15:15-15:30	Zhao-Jun Feng. Nanjing University of Aeronautics and Astronautics. Analysis
	on the dynamic characteristics of the dual-rotor structures of a certain aero-
	engine.

Day 2: September 27 Location: Building 6, Xikang Hotel (Room #3)

	PARALLEL ORAL SESSION 11 "Vibration theories and applications"
	Session Chair Prof. Maosen Cao
14:00-14:15	Yonghui An. Dalian University of technology. Numerical validation of a
	damage diagnosis method for arch bridges hangers.
14:15-14:30	Ruifeng Yang. Mechanical Engineering College, Shijiazhuang. Preventive
	maintenance optimization policy based on a three-stage failure process in finite
	time horizon.





14:30-14:45	Yingjun Wang. Nanjing University.
	Research on friction parameter identification under the influence of vibration
	and collision.
14:45-15:00	Thasin Suansakaew. Defense Technology Institute, Bangkok.
	AISI 4340 Detention Behaviors in High Temperature Environment.
15:00-15:15	Zhou Jie. University of Electronic Science and Technology of China.
	Simulation and Analysis on Fatigue Life of the Rigid-flex Coupling Model of a
	Certain Gear Transmission System.
15:15-15:30	Yao Fu. Nanjing University of Aeronautics and Astronautics.
	Research on Influences of geometry parameters on floating-ring squeeze film
	damper.

Day 2: September 27

15:30-15:45 Coffee Break
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Day 2: September 27 Location: Building 6, Xikang Hotel (Room #1)

	PARALLEL ORAL SESSION 12 "Vibration theories and applications"
	Session Chair Prof. Yufeng Gao
15:45-16:00	Shu Li. Chongqing University.
	The improved method of coherent sources with double layers.
16:00-16:15	Sun Bin. Southeast University, Nanjing. Adaptive multi-grid method for
	dynamic simulation on seismic damage evolution of concrete structures.
16:15-16:30	Chuan-Zhi Dong. Zhejiang University, Hangzhou.
	Non-contact structural vibration monitoring under varying environmental
	conditions.
16:30-16:45	Ruicong Han. Dalian University of Technology. Convenient displacement
	monitoring technique using smartphone.
16:45-17:00	Yi-Chen Yuan. Huazhong University of Science and Technology, Wuhan.
	The sensitivity analysis of translation and rotation angle of the first-order mode
	shape of the joints in frame structures.
17:00-17:15	Runtao Zhan. Jiangsu Key Laboratory of Engineering Mechanics.
	Dynamic stress intensity factors of Mode III finite crack in a viscoelastic
	medium based on fractional differential constitutive model.
17:15-17:30	Subhash Rakheja. Concordia University, Montreal.
	Optimum design of a partially-treated MR-fluid sandwich plate.





Day 2: September 27 Location: Building 6, Xikang Hotel (Room #2)

	PARALLEL ORAL SESSION 13 "Vibration theories and applications"
	Session Chair Prof. Qiusheng Li
15:45-16:00	Fan Yang. Huaqiao University.
	Optimum Design of a Partially-Treated MR-fluid Sandwich Plate.
16:00-16:15	Hongfei Yao. Nanjing University of Aeronautics and Astronautics. Modal
	analysis of the certain membrane disc coupling.
16:15-16:30	Hao Xu. The Hong Kong Polytechnic University. A vibration-based damage
	identification technique free of structural baseline information: experimental
	validation in multi-component plane structure.
16:30-16:45	Chunyu Wang. Naval University of Engineering, Wuhan.
	Research on active control strategy of vibration in complex environment.
16:45-17:00	Ruicong Han. Dalian University of Technology. Cloud-Structural Health
	Monitoring based on smartphone.
17:00-17:15	Narongkorn Dernlugkam. Defence Technology Institute, Pakkred. Reliability
	determination of ignition system of rocket platform using reliability block
	diagram and FMEA analysis.

Day 1: September 26 Location: Building 6, Xikang Hotel (Room #3)

	PARALLEL ORAL SESSION 14 "Vibration theories and applications"
	Session Chair Prof. Minvydas Ragulskis
15:45-16:00	Chunfei Xu. Nanjing University.
	Multi-objective topology optimization for the measuring rod of gun barrel bore
	detecting system.
16:00-16:15	Xiang Zhang, Nanjing University.
	A method of strain measurement based on Fiber Bragg Grating sensors.
16:15-16:30	Ying Li. Beijing University of Technology.
	Thermodynamic performance analysis and improvement for cross-saddle type
	slide of electric discharge machine.
16:30-16:45	Huang Minshui. Wuhan Institute of Technology.
	Experimental study on shear lag of curved box girder under earthquake
	excitation.
16:45-17:00	<b>Tian Yang.</b> Beijing University of Technology. Study on dynamic characteristics
	of heavy duty machine tools – foundation interaction system.
17:00-17:15	Guohua Cao. China University of Mining and Technology, Xuzhou. Finite
	Element Analysis of Coupled Vibration for Hoisting Cable with Time-varying
	Length.





Day 2: September 27

	CLOSING SESSION
17:30-17:40	Chairs Prof. Maosen Cao & Prof. Minvydas Ragulskis Ideas, Cooperation and Projects Meeting All Conference participants are welcome to attend
17:40-17:45	Chairs Prof. Maosen Cao & Prof. Minvydas Ragulskis Best Papers Award, Closing Ceremony

Day 2: September 27

18:30-20:00	Dinner
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