

SAE 2015 Noise and Vibration Conference and Exhibition Technical Session Schedule

As of 06/28/2015 07:41 pm

Monday, June 22

SEA for Design Applied to Wind Noise

Session Code: NVCWK1

Room Ballroom C

Session Time: 2:30 p.m.

Wind noise is an important NVH attribute that can significantly impact customer satisfaction. It is important to assess this attribute early in the design phase. Statistical Energy Analysis (SEA) is an analytical tool that is capable of assessing the wind noise performance of a vehicle in the concept design phase. This workshop starts with an overview of the wind noise problem. Then assessing the wind loads from an experimental and computational approach is discussed. Finally the interior noise assessment via a SEA model is presented. This workshop will be tutorial in nature.

Organizers - Mark Moeller

Time	Paper No.	Title
	ORAL ONLY	Introduction and Opening Comments <i>Richard DeJong, Calvin Engineering</i>
	ORAL ONLY	Wind Noise Industry Perspective <i>Alexander Kabat vel Job, Volkswagen Aktiengesellschaft</i>
	ORAL ONLY	Measuring Wind Loads <i>Paul Bremner, Aero Hydroplus</i>
	ORAL ONLY	CFD to Predict Wind Loads <i>Phil Shorter, CD-adapco</i>
	ORAL ONLY	SEA Modeling for Wind Noise <i>Richard DeJong, Calvin Engineering</i>

Monday, June 22

Acoustical Materials Workshop

Session Code: NVCWK2

Room Ballroom C

Session Time: 4:30 p.m.

The Acoustical Materials Workshop will cover a variety of topics by long time industry experts from OEM and supplier communities. The workshop will start with basics of noise control for those who are new to the industry, followed by presentation of various SAE standards related to measurements of acoustical materials. And finally, the workshop will address NVH priorities and challenges from OEM perspective.

Organizers - Rolf Hermann Balte, HP Pelzer Auto Systems Inc.; Gordon Ebbitt, Toyota Technical Center USA Inc.; Kent (Ka Hing) Fung, Sika Automotive; Jian Pan, Autoneum North America Inc.

Time	Paper No.	Title
	ORAL ONLY	Basics of Noise Control <i>Rolf Hermann Balte, HP Pelzer Auto Systems Inc.; Andrea Lynne Frey, Bruel & Kjaer North America Inc.</i>
	ORAL ONLY	Acoustical and Other Performance of Materials Through SAE Standards <i>Pranab Saha, Kolano and Saha Engineers Inc.</i>
	ORAL ONLY	NVH Priorities and Challenges in Vehicle Design and Development <i>Taner Onsay, FCA US LLC</i>

Tuesday, June 23

Welcome, Opening and Keynote Address

Session Code: NVCK1

Room Ballroom A

Session Time: 8:30 a.m.

Moderators - Christopher Shaw, Halla Visteon Climate Control Corp.

Keynote Speakers - Richard Schumacher, Independent Consultant, Acoustic & Regulatory Issues & GM Retired

Tuesday, June 23

Materials (Part 1 of 2)

Session Code: NVC300

Room Ballroom C

Session Time: 10:00 a.m.

This session will cover materials used to solve noise and vibration problems in vehicles. Topics covered will include new and traditional NVH materials, materials with unique or special NVH properties, case studies covering applications of NVH materials to solve specific vehicle problems, modeling of materials, manufacturing or processing of NVH materials, and engineering and design principles for the use of NVH materials.

Organizers - Jason T. Kunio, Bruel & Kjaer North America Inc.; Jian Pan, Autoneum North America Inc.; David B. Reed, Janesville Acoustics; Pranab Saha, Kolano and Saha Engineers Inc.; Steve Sorenson, E-A-R Thermal Acoustic Systems; Barry Robert Wyerman, Janesville Acoustics

Time	Paper No.	Title
10:00 a.m.	2015-01-2206	Acoustic Performance Evaluation of Hood Liner Constructions Glenn Yin, Alan Parrett, Nitish Wagh, Dennis Kinchen, General Motors Co.
10:20 a.m.	2015-01-2203	Modeling and Characterization of a Novel Porous Metallic Foam Inside Ducts Maaz Farooqui, Tamer Elnady, Ain Shams University; Ragnar Glav, Scania AB; Tony Karlsson, Scania CV AB
10:40 a.m.	2015-01-2205	Acoustics Characterization of Nano Enhanced Open Cell Foams John G. Cherng, Simeng Xing, Weiwei Wu, University of Michigan; Jan Ladewig, Rolf Balte, Maurice Venegas, HP Pelzer Automotive Systems Inc.
11:00 a.m.	2015-01-2200	Study on the Influence of Material Parameters to Acoustic Performance Guojian Zhou, Xiujie Tian, Keda Zhu, Wei Huang, Richard E. Wentzel, Melvyn J. Care, Gissing Tech. Co., Ltd.
11:20 a.m.	2015-01-2201	Use of a Portable Flanged Impedance Tube for Absorber Design and Measurement Paul B. Murray, Morrisbrand Ltd.; Jason T. Kunio, Bruel & Kjaer North America Inc.; Leif Christensen, Flemming S. Larsen, Bruel & Kjaer Sound and Vibration Measurement A/S
	2015-01-2210	The Stability Analysis of FOAM-X Software in Porous Fiber Absorption Material (Written Only -- No Oral Presentation) Quan Wan, 3M China Limited

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00462, and also individually. To purchase visit collections.sae.org

Tuesday, June 23

Materials (Part 2 of 2)

Session Code: NVC300

Room Ballroom C

Session Time: 2:30 p.m.

This session will cover materials used to solve noise and vibration problems in vehicles. Topics covered will include new and traditional NVH materials, materials with unique or special NVH properties, case studies covering applications of NVH materials to solve specific vehicle problems, modeling of materials, manufacturing or processing of NVH materials, and engineering and design principles for the use of NVH materials.

Organizers - Jason T. Kunio, *Bruel & Kjaer North America Inc.*; Jian Pan, *Autoneum North America Inc.*; David B. Reed, *Janesville Acoustics*; Pranab Saha, *Kolano and Saha Engineers Inc.*; Steve Sorenson, *E-A-R Thermal Acoustic Systems*; Barry Robert Wyerman, *Janesville Acoustics*

Time	Paper No.	Title
2:30 p.m.	2015-01-2208	Vibration Design of Experiments with Varying Factors on a Panel-Beam System <i>David Stotera, Scott Bombard, Henkel Corp.</i>
2:50 p.m.	2015-01-2207	SAE and Other Standards for Determining Acoustical Properties of Sound Package Materials <i>Pranab Saha, Satyajeet P. Deshpande, Kolano and Saha Engineers Inc.; Charles Moritz, Blachford Inc.; Steve Sorenson, E-A-R Thermal Acoustic Systems</i>
3:10 p.m.	2015-01-2202	Advancements in Liquid Damping Materials <i>Catheryn Jackson, Justin E. Gimbal, Dhara Metla, Dow Chemical Co.</i>
3:30 p.m.	2015-01-2204	The Effect of Plasticizers on Vibration Damping in Polyvinyl Chloride (PVC) Formulations <i>Michael Funderburg, Eastman Chemical Co.</i>

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00462, and also individually. To purchase visit collections.sae.org

Tuesday, June 23

Components / Accessories

Session Code: NVC102

Room Ballroom C

Session Time: 4:40 p.m.

This session is focused on base engine, mounts, accessories, fuel injection system, combustion system, turbo chargers, EGR system, transmission related design or development noise and vibration topics. With the advent of GDI engines- the performance vs. NVH relationship has become more interesting and challenging. The papers of this session will have both experimental and analytical approaches to problem solving.

Organizers - Kalyan Singh Bagga, *Hether Fedullo, Ford Motor Co.*; In-Soo Suh, *KAIST*; Prakash T. Thawani, *DENSO International America Inc.*; Joachim Wolschendorf, *FEV Inc.*

Time	Paper No.	Title
4:40 p.m.	2015-01-2253	Power Plant Model of Fuel Consumption and Vibration for Vehicle Concept Planning <i>Kimitoshi Tsuji, Katsuhiko Yamamoto, Toyota Motor Corp.</i>
5:00 p.m.	2015-01-2255	Mechanism of Low Frequency Idling Vibration in Rear-Wheel Drive Hybrid Vehicle Equipped with THS II <i>Jun Kokaji, Masashi Komada, Masayuki Takei, Masaya Takeda, Toyota Motor Corp.</i>

5:20 p.m.	2015-01-2254	Design of Isolation Pulley in Front of Crankshaft to Reduce Vibrations of Front End Accessory Drive System (Written Only -- No Oral Presentation) Wen-Bin Shangguan, Xiao Feng, South China University of Technology
5:40 p.m.	2015-01-2252	Research on the Optimal Design of Engine Mounts by Minimizing Transfer Power based on Identifying Excitation and Admittance Matrix Haixin Dai, Weikang Jiang, Shanghai Jiao Tong Univ.; Yuanyi Huang, SAIC-GM-WULING Automobile Co., Ltd.
	2015-01-2256	Some Aspects of Rigid Body Dynamics of Power Trains Using Dedicated Software with Respect to Noise and Vibration (Written Only -- No Oral Presentation) Colin Troth

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00462, and also individually. To purchase visit collections.sae.org

Tuesday, June 23

Vibro Acoustic Analysis (Part 1 of 2)

Session Code: NVC602

Room Ballroom D

Session Time: 10:00 a.m.

This session covers the relationships between vibration and noise that can be generated throughout the vehicle. Included in this session are modal vibration studies related to noise, vibration transfer paths throughout the vehicle, and coupling of vibration and acoustical modes. Both experimental and analytical approaches are included in this session.

Organizers - Bryce Gardner, ESI US R&D; Gary Newton, Bruel & Kjaer North America Inc.;
Taner Onsay, Chrysler Group LLC

Time	Paper No.	Title
10:20 a.m.	2015-01-2240	Application of Patch Contribution Analysis to a Motorcycle Engine Gong Cheng, David W. Herrin, University of Kentucky
10:40 a.m.	2015-01-2234	Engine Block Dynamic Response via Combustion Noise Radiation Giancarlo Chiatti, Ornella Chiavola, Silvia Conforto, Manfredi Amalfi, ROMA TRE University
11:20 a.m.	2015-01-2236	Hybrid FEA-SEA Modeling Approach for Vehicle Transfer Function Parimal Tathavadekar, FCA US LLC; Ricardo O. de Alba Alvarez, ESI North America; Michael Sanderson, FCA US LLC; Rabah Hadjit, ESI North America
	2015-01-2242	The Design Optimization of Interior Noise in Vehicle Based on Response Surface Method (Written Only -- No Oral Presentation) Ling Zheng, Zhanpeng Fang, Chongqing University

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00462, and also individually. To purchase visit collections.sae.org

Tuesday, June 23

Vibro Acoustic Analysis (Part 2 of 2)

Session Code: NVC602

Room Ballroom D

Session Time: 2:30 p.m.

This session covers the relationships between vibration and noise that can be generated throughout the vehicle. Included in this session are modal vibration studies related to noise, vibration transfer paths throughout the vehicle, and coupling of vibration and acoustical modes. Both experimental and analytical approaches are included in this session.

Organizers - Bryce Gardner, ESI US R&D; Gary Newton, Bruel & Kjaer North America Inc.;
Taner Onsay, Chrysler Group LLC

Time	Paper No.	Title
2:30 p.m.	2015-01-2237	Structural-Acoustic Joints for Incompatible Models in the Energy Finite Element Analysis <i>Nickolas Vlahopoulos, University of Michigan; Sergey Medyanik, Michigan Engineering Services</i>
2:50 p.m.	2015-01-2235	Evolution of Trim Modeling with PEM for Structureborne Noise Prediction in Full Vehicle <i>Arnaud Caillet, Denis Blanchet, ESI GmbH</i>
3:10 p.m.	2015-01-2239	Structural Damping by the Use of Fibrous Materials <i>Nicholas N. Kim, Seungkyu Lee, J Stuart Bolton, Purdue University; Sean Hollands, Polytec Inc; Taewook Yoo, 3M</i>
3:30 p.m.	2015-01-2238	Wavelet Analysis for the Characterization of Abrupt and Transient Phenomena in Electric Drivelines <i>Marina Roche, Marco Mammetti, Claudi Crifaci, Applus IDIADA</i>
	2015-01-2243	Numerical Simulation of Aerodynamic Noise in a Turbocharger (Written Only -- No Oral Presentation) <i>Yang Liu, Pingjian Ming, Wenping Zhang, Xinyu Zhang, Harbin Engineering University</i>
	2015-01-2244	An Approach for Prediction of Motorcycle Engine Noise under Combustion Load (Written Only -- No Oral Presentation) <i>Ulhas Mohite, Niket Bhatia, Prashant Bhavsar, Mahindra 2 Wheelers Limited</i>
	2015-01-2245	CAE Simulation of Engine Tonal Noise Generated by Gerotor Oil Pumps (Written Only -- No Oral Presentation) <i>Mohammad Moetakef, Abdelkrim Zouani, Ford Motor Co.</i>

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Tuesday, June 23

Heavy Duty Truck / Off-Highway

Session Code: NVC800

Room Ballroom D

Session Time: 4:40 p.m.

This session covers noise and vibration in heavy trucks and buses and all other off-road vehicles. Special attention will be focused on the noise and vibration problems found in these vehicles, as opposed to passenger cars and light trucks, and to the engineering solutions required to solve these problems. Included in the session are discussions of special measurement methods, modeling specifically directed to these vehicles, and NVH materials with special properties to address unique problems.

Organizers - Craig Birkett, Navistar International Corp.; Peter Jackson, American Acoustical Products Inc.; Charles Moritz, Blachford Inc.; Pranab Saha, Kolano and Saha Engineers Inc.

Time	Paper No.	Title
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- 4:40 p.m. 2015-01-2350 **The Effect of Mounting Structure Stiffness on Mounting System Isolation Performance on Off-Highway Machines**
Jiantie Zhen, Scott Fredrickson, Caterpillar Inc.
- 5:00 p.m. 2015-01-2349 **Obtaining Structure-borne Input for Hybrid FEA/SEA Engine Enclosure Models through a Simplified Transfer Path Analysis**
Jiantie Zhen, David Copley, Niranjan Londhe, Scott Fredrickson, Caterpillar Inc.

Tuesday, June 23

Chat with the Experts

Session Code: NVCTC

Room Exhibit Hall

Session Time: 1:30 p.m.

- Organizers -** Thomas L. Lago, QirraSound Technologies Europe AB
- Presenters -** Kalyan Singh Bagga, Ford Motor Company; Thomas L. Lago, QirraSound Technologies Europe AB; Pranab Saha, Kolano and Saha Engineers Inc.; James K. Thompson, NIOSH

Tuesday, June 23

Driveline (Part 1 of 5)

Session Code: NVC103

Room Grand Gallery Room A

Session Time: 10:00 a.m.

This session deals with analytical, computational and experimental studies of the dynamic response including noise and vibration of automotive driveline system and components. Typical topics of interests include, but not limited to, torque converters, gear noise, axle noise driveline system dynamics, transmission noise and vibrations, powertrain dynamics, transient dynamic response and propshaft balancing.

- Organizers -** Hether Fedullo, Ford Motor Co.; Kiran Govindswamy, FEV Inc.; Teik C. Lim, Univ. of Cincinnati; Jeff Orzechowski, Chrysler Group LLC; Mohamad Qatu, Central Michigan Univ.; Joseph L. Stout, Ford Motor Co.; In-Soo Suh, KAIST

Time	Paper No.	Title
10:00 a.m.	2015-01-2171	Study of Stick-Slip Friction between Plunging Driveline Winston Spencer, Djamel Bouzit, Joseph Pace, Sudeep Dhillon, Ford Motor Co.
10:20 a.m.	2015-01-2186	Powertrain Metric to Assess Engine Stop Start Refinement Sudharsan Srinivasan, Jeff Orzechowski, Michael Schoenherr, FCA US LLC
10:40 a.m.	2015-01-2182	Interaction of Gear-Shaft Dynamics Considering Gyroscopic Effect of Compliant Driveline System Yawen Wang, Junyi Yang, University of Cincinnati; Xuan Li, Chongqing University; Guohua Sun, Teik Lim, University of Cincinnati
11:00 a.m.	2015-01-2172	Geometry Design of a Non-Pin Cycloid Drive for In-Wheel Motor Xuan Li, Bingkui Chen, Chongqing University; Yawen Wang, Guohua Sun, Teik Lim, University of Cincinnati
	2015-01-2190	Dynamic Stiffness Estimation of Elastomeric Mounts Using OPAX in an AWD Monocoque SUV (Written Only -- No Oral Presentation) Manchi Venkateswara Rao, S Nataraja Moorthy, Mahindra & Mahindra, Ltd.; Prasath Raghavendran, Automotive OEM

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Tuesday, June 23

Driveline (Part 2 of 5)

Session Code: NVC103

Room Grand Gallery Room A

Session Time: 2:30 p.m.

This session deals with analytical, computational and experimental studies of the dynamic response including noise and vibration of automotive driveline system and components. Typical topics of interests include, but not limited to, torque converters, gear noise, axle noise driveline system dynamics, transmission noise and vibrations, powertrain dynamics, transient dynamic response and propshaft balancing.

Organizers - Hether Fedullo, Ford Motor Co.; Kiran Govindswamy, FEV Inc.; Teik C. Lim, Univ. of Cincinnati; Jeff Orzechowski, Chrysler Group LLC; Mohamad Qatu, Central Michigan Univ.; Joseph L. Stout, Ford Motor Co.; In-Soo Suh, KAIST

Time	Paper No.	Title
2:30 p.m.	2015-01-2173	Elastohydrodynamic Lubrication Damping of Spiral Bevel Gears at Moderate Loads Srikumar C Gopalakrishnan, Teik Lim, University of Cincinnati
2:50 p.m.	2015-01-2178	Application of Optimal Morlet Wavelet Filter for Bearing Fault Diagnosis Mohamed El Morsy, CTU in Prague & Helwan University, Egypt; Gabriela Achtenova, Czech Technical University in Prague
3:10 p.m.	2015-01-2181	Tuning Axle Whine Characteristics with Emphasis on Gear Dynamics and Psychoacoustics Dong Guo, Southwest Jiaotong University; Yawen Wang, Teik Lim, University of Cincinnati; Peng Yi, Chongqing Academy of Science and Tech
3:30 p.m.	2015-01-2185	Experimental Investigation of Power Hop in Passenger Cars Simon Eicke, Leibniz Universität Hannover; Steffen Zemke, Ahmed Trabelsi, IAV Automotive Engineering; Matthias Dagen, Tobias Ortmaier, Leibniz Universität Hannover
3:50 p.m.	2015-01-2183	Influence of Automatic Engine Stop/Start Systems on Vehicle NVH and Launch Performance Thomas Wellmann, Kiran Govindswamy, FEV North America, Inc.; Jeff Orzechowski, Sudharsan Srinivasan, FCA US LLC

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00462, and also individually. To purchase visit collections.sae.org

Tuesday, June 23

Driveline (Part 3 of 5)

Session Code: NVC103

Room Grand Gallery Room A

Session Time: 4:40 p.m.

This session deals with analytical, computational and experimental studies of the dynamic response including noise and vibration of automotive driveline system and components. Typical topics of interests include, but not limited to, torque converters, gear noise, axle noise driveline system dynamics, transmission noise and vibrations, powertrain dynamics, transient dynamic response and propshaft balancing.

Organizers - Hether Fedullo, Ford Motor Co.; Kiran Govindswamy, FEV Inc.; Teik C. Lim, Univ. of Cincinnati; Jeff Orzechowski, Chrysler Group LLC; Mohamad Qatu, Central Michigan Univ.; Joseph L. Stout, Ford Motor Co.; In-Soo Suh, KAIST

Time	Paper No.	Title
4:40 p.m.	2015-01-2175	Optimization of Propshaft Liner Tuning and Damping: A SYLENT Approach Jason Ley, Zhaohui Sun, William Braun, Jeffrey Nyquist, American Axle & Mfg Inc.
5:00 p.m.	2015-01-2188	NVH Development of Aluminum Axles Zhaohui Sun, Glen Steyer, Chih Hung Chung, Gregory Kopp, American Axle & Mfg Inc.
	2015-01-2174	Study on the Bending Vibration of a Two-Piece Propeller Shaft for 4WD Driveline (Written Only -- No Oral Presentation) Yuanfeng Xia, Jian Pang, Cui Zhou, Hongcheng Li, Wenjuan Li, Changan Automobile Co., Ltd.

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Tuesday, June 23

Active Noise and Vibration (Part 1 of 2)

Session Code: NVC302

Room Grand Gallery Room B

Session Time: 10:00 a.m.

This session addresses the strategies and methods for implementing active noise and vibration control in a vehicle. It will cover sensors and transducers, feedback systems, control algorithms, software for active control, noise and vibration cancellation devices, noise and vibration measurement systems, and case studies.

Organizers - Thomas L. Lago, QirraSound Technologies Europe AB; Jeff Orzechowski, Chrysler Group LLC; Guohua Sun, University of Cincinnati

Time	Paper No.	Title
10:00 a.m.	2015-01-2217	Modified FxLMS Algorithm with Equalized Convergence Speed for Active Control of Powertrain Noise Guohua Sun, Tao Feng, Ji Xu, Mingfeng Li, Teik Lim, University of Cincinnati
10:20 a.m.	2015-01-2220	Fast Active Sound Tuning System for Vehicle Powertrain Response Ji Xu, Guohua Sun, Tao Feng, University of Cincinnati; Mingfeng Li, NIOSH Pittsburgh Res Lab; Teik Lim, University of Cincinnati
10:40 a.m.	2015-01-2222	Active Control of Structure-Borne Road Noise Based on the Separation of Front and Rear Structural Road Noise Related Dynamics Nikos Zafeiropoulos, University of Salford; Marco Ballatore, Bentley Motors Ltd.; Andy Moorhouse, Andy Mackay, University of Salford
11:00 a.m.	2015-01-2223	Current Status and Future Developments of ANC Systems Rolf Schirmacher, Müller-BBM Active Sound Technology GmbH
11:20 a.m.	2015-01-2224	An Active Control System for Improving the Sound Quality of Vehicle Interior Noise Yong Xu, Huachen Automotive Group Holdings Co., Ltd.

11:40 a.m.	2015-01-2219	A Method for Detecting Undesirable Microphone Disturbance in ANC Applications <i>AI Ganeshkumar, Shinichi Fukuhara, Bose Corp.</i>
	2015-01-2214	A New Narrowband Active Noise Control System in the Presence of Frequency Mismatch and its Application for Steady-State Blower Noise (Written Only -- No Oral Presentation) <i>Shuguang Zuo, Tongji Univ.; Guo Long, Clean Energy Auto Engineering Center; Xudong Wu, Jiajie Hu, Longyang Xiang, Jun Zhang, Tongji Univ.</i>
	2015-01-2218	Study on Active Noise Control of Blower in Fuel Cell Vehicle under Transient Conditions (Written Only -- No Oral Presentation) <i>Shuguang Zuo, Jun Zhang, Xudong Wu, Jiajie Hu, Guo Long, Tongji University</i>
	2015-01-2225	Optimization of EV Mounting System Considering Power Train Torsion Control (Written Only -- No Oral Presentation) <i>Peng Yu, Tong Zhang, Jing Li, Shiyang Chen, Rong Guo, Tongji University</i>

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Tuesday, June 23

Active Noise and Vibration (Part 2 of 2)

Session Code: NVC302

Room Grand Gallery Room B

Session Time: 2:30 p.m.

This session addresses the strategies and methods for implementing active noise and vibration control in a vehicle. It will cover sensors and transducers, feedback systems, control algorithms, software for active control, noise and vibration cancellation devices, noise and vibration measurement systems, and case studies.

Organizers - Thomas L. Lago, QirraSound Technologies Europe AB; Jeff Orzechowski, Chrysler Group LLC; Guohua Sun, University of Cincinnati

Time	Paper No.	Title
2:30 p.m.	2015-01-2215	Overview on ANVC Systems and the Future with Smart Embedded Solutions <i>Thomas L. Lago, QirraSound Technologies Europe AB</i>
2:50 p.m.	2015-01-2216	Development of Personalized Engine Sound System using Active Sound Design Technology <i>Dong Chul Park, Eun Soo Jo, Seokgwon Hong, Hyundai Motor Company; Michael Csakan, Hyundai-Kia America Technical Center Inc</i>
3:10 p.m.	2015-01-2211	Exhaust Noise Reduction in Two-Stroke Snowmobile: Development of a Mechanically Active Quarter Wave Resonator <i>Michael J. Santora, Dillon Savage, University of Idaho</i>
3:30 p.m.	2015-01-2213	Random Averaging <i>John Van Baren, Vibration Research Corp.</i>
	2015-01-2212	Vibration Mitigation of Structural Suspension Using Active Mount (Written Only -- No Oral Presentation) <i>A. Elsawaf, H. Metered, Czech Tech. Univ Prague and Helwan Univ.; T. Vampola, Z. Sika, Czech Technical University Prague</i>

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Tuesday, June 23

Tires (Part 1 of 2)

Session Code: NVC202

Room Grand Gallery Room C

Session Time: 10:00 a.m.

This session includes papers regarding tire and vibration as an isolated component as well as part of a vehicle system. It includes modeling of tire vibration, measurement methods, and full vehicle system performance. The papers deal with both exterior and interior tire/pavement noise.

Organizers - Paul R. Donavan, Illingworth & Rodkin Inc.; Saeed J. Siavoshani, Siemens PLM Software

Time	Paper No.	Title
10:00 a.m.	2015-01-2193	Evaluation of Spring Properties of Tire Sidewall under Changes in Inflation Pressure Masami Matsubara, Daiki Tajiri, Makoto Horiuchi, Shozo Kawamura, Toyohashi Univ. of Technology
10:20 a.m.	2015-01-2194	Simplified FE Modeling of Rolling Tires for the Simulation of Dynamic Forces at Hub Level Giorgio Bartolozzi, Marco Danti, CRF S.C.p.A.; Guido Nierop, Andrea Camia, FCA Italy S.p.A.
10:40 a.m.	2015-01-2196	Evidence of Real-World Tire Flat-Spotting and Its Effect on Vehicle Performance Farokh Kavarana, Scott Fritz, John DeYoung, Nissan Technical Center NA
11:00 a.m.	2015-01-2197	Comparison of Two Measurement Methods for Exterior Noise Radiation Characterization of a Loaded Rotating Tyre Stijn Vercammen, Goodyear Innovation Center Luxembourg; Fabio Bianciardi, Siemens Industry Software; Peter Kindt, Goodyear Innovation Center Luxembourg; Wim Desmet, Paul Sas, KU Leuven

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Tuesday, June 23

Tires (Part 2 of 2)

Session Code: NVC202

Room Grand Gallery Room C

Session Time: 2:30 p.m.

This session includes papers regarding tire and vibration as an isolated component as well as part of a vehicle system. It includes modeling of tire vibration, measurement methods, and full vehicle system performance. The papers deal with both exterior and interior tire/pavement noise.

Organizers - Paul R. Donavan, Illingworth & Rodkin Inc.; Saeed J. Siavoshani, Siemens PLM Software

Time	Paper No.	Title
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2:30 p.m.	2015-01-2198	Natural Frequency Analysis of Tire Vibration Using a Thin Cylindrical Shell Model Masami Matsubara, Toyohashi Univ. of Technology; Nobutaka Tsujiuchi, Takayuki Koizumi, Akihito Ito, Doshisha Univ.; Kensuke Bito, Toyo Tire & Rubber Co., Ltd.
2:50 p.m.	2015-01-2199	Improved Model for Coupled Structural-Acoustic Modes of Tires Rui Cao, J Stuart Bolton, Purdue University
3:10 p.m.	2014-01-0022 *	Development of a New On-Wheel Resonator for Tire Cavity Noise Youichi Kamiyama, Honda R&D Co. Ltd.

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00462, and also individually. To purchase visit collections.sae.org

* Previously published and/or presented at the SAE 2014 World Congress & Exhibition, SAE/JSAE 2014 Small Engine Technology Conference & Exhibition

Tuesday, June 23

Student Paper Judging (Group 1)

Session Code: NVCSTP1

Room Grand Gallery Room C

Session Time: 4:40 p.m.

Moderators - Satyajeet P. Deshpande, Kolano and Saha Engineers Inc.; Jeff Orzechowski, Chrysler Group LLC; Farokh Kavarana, Nissan Technical Center NA; Chadwyck Musser, ESI US R&D

Time	Paper No.	Title
4:40 p.m.	2015-01-2172	Geometry Design of a Non-Pin Cycloid Drive for In-Wheel Motor Xuan Li, Bingkui Chen, Chongqing University; Yawen Wang, Guohua Sun, Teik Lim, University of Cincinnati
5:00 p.m.	2015-01-2180	Development of Refined Clutch-Damper Subsystem Dynamic Models Suitable for Time Domain Studies Almahdi Saleh, Michael Krak, Jason Dreyer, Rajendra Singh, Ohio State University
5:20 p.m.	2015-01-2182	Interaction of Gear-Shaft Dynamics Considering Gyroscopic Effect of Compliant Driveline System Yawen Wang, Junyi Yang, University of Cincinnati; Xuan Li, Chongqing University; Guohua Sun, Teik Lim, University of Cincinnati
5:40 p.m.	2015-01-2189	Development of a Non-Linear Clutch Damper Experiment Exhibiting Transient Dynamics Michael Krak, Jason Dreyer, Rajendra Singh, Ohio State Univ.
6:00 p.m.	2015-01-2355	Dynamic Analysis of Hydraulic Bushings with Measured Nonlinear Compliance Parameters Luke Fredette, Jason Dreyer, Rajendra Singh, Ohio State University

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Tuesday, June 23

Structural Analysis

Session Code: NVC600

Room Grand Gallery Room D

Session Time: 10:00 a.m.

This session focuses on the development and application of analytical methods for characterizing the dynamic behavior of structural systems. Analysis methods for all structural components, subsystems and complete systems found in automotive vehicles will be considered, except for powertrain and driveline which are covered in Powertrain Structural Analysis session. Examples include (but are not limited to) body structure, chassis structure, seats and interior structures.

Organizers - David W. Herrin, Univ. of Kentucky; Christopher Shaw, Visteon Climate Control

Time	Paper No.	Title
10:00 a.m.	2015-01-2226	Determination of the Transfer Matrix for Isolators Using Simulation with Application to Determining Insertion Loss Shishuo Sun, David W. Herrin, John Baker, University of Kentucky
10:20 a.m.	2015-01-2227	Volumetric and Dynamic Performance Considerations of Elastomeric Components Scott Allen Noll, Benjamin Joodi, Jason Dreyer, Rajendra Singh, Ohio State University
10:40 a.m.	2015-01-2228	A Multibody Dynamics Approach to Leaf Spring Simulation for Upfront Analyses Kalyan Chakravarthy Addepalli, Natalie Remisoski, Anthony Sleath, Shyiping Liu, Ford Motor Co.
11:00 a.m.	2015-01-2229	Comparative Assessment of Frequency Dependent Joint Properties Using Direct and Inverse Identification Methods Benjamin Joodi, Scott Allen Noll, Jason Dreyer, Rajendra Singh, Ohio State University
11:20 a.m.	2015-01-2230	Handling Metal Cutting Vibrations in Real Time Using Active Vibration Control Thomas L. Lago, QirraSound Technologies Europe AB
11:40 a.m.	2015-01-2231	Prediction of Gear Vibration Transmitted through Engine Mounting System Masashi Arakawa, Miho Nakatsuka, Hiroo Yamaoka, Toyota Motor Corp
	2015-01-2233	Role of Springs in Exhaust Brake Assembly and its Contribution in Dynamic Analysis (Written Only -- No Oral Presentation) Hudson P Vijayakumar, V Shivaraj, Wabco India Ltd.; T Sukumar, Automotive CAE; Suresh Gaikwad, Wabco Vehicle Control Systems

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Tuesday, June 23

Sound Source Identification

Session Code: NVC402

Room Grand Gallery Room D

Session Time: 2:30 p.m.

This session covers sound source identification and localization, acoustical holography, sound generation mechanisms, measurement techniques related to the sound source and noise propagation, and visualization techniques for sound pressure levels, sound radiation patterns, frequency content, and intensity. Also included are prediction and modeling methods related to the sound source.

Organizers - Gabriella Cerrato, Sound Answers Inc.; Gary Newton, Bruel & Kjaer North America Inc.

<i>Time</i>	<i>Paper No.</i>	<i>Title</i>
2:30 p.m.	2015-01-2247	Noise Source Localization by Double NAH Method Masao Nagamatsu, Hokkaido University of Science
2:50 p.m.	2015-01-2248	Assessing Panel Noise Contribution of a Car Engine Using Particle Velocity Sensors Florian Pignol, Emiel Tijs, Daniel Fernandez Comesana, Microflown Technologies BV; Daewoon Kim, Hyundai Motor Company
3:10 p.m.	2015-01-2249	Aeroacoustic Prediction Methods of Automotive HVAC Noise Saad Bennouna, Said Naji, Olivier Cheriaux, Valeo Thermique Habitable; Solene Moreau, Boureima Ouedraogo, Jean Michel Ville, Université de Technologie de Compiègne
3:30 p.m.	2015-01-2250	Identification of Sound Source Model Using Inverse-Numerical Acoustic Analysis and Noise Prediction for Engine Enclosure Masahiro Akei, Yanmar Co., Ltd.; Nobutaka Tsujiuchi, Akihito Ito, Takayuki Yamauchi, Daisuke Kubota, Doshisha University
	2015-01-2251	Effective Placement of Noise Control Acoustic Material in a Vehicle for a Typical Front of Dash Application by Identifying Critical Location Area through Effective Sound Intensity Mapping Method (Written Only -- No Oral Presentation) Alex Varghese, Satish Palled, 3M India Limited

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Tuesday, June 23

Student Paper Judging (Group 2)

Session Code: NVCSTP2

Room Grand Gallery Room D

Session Time: 4:40 p.m.

Moderators - Wade R. Bray, HEAD acoustics Inc.; Jack C. Field, National Instruments; David B. Reed, Janesville Acoustics; Robert Powell, Exa Corporation; Pranab Saha, Kolano and Saha Engineers Inc.

<i>Time</i>	<i>Paper No.</i>	<i>Title</i>
4:40 p.m.	2015-01-2199	Improved Model for Coupled Structural-Acoustic Modes of Tires Rui Cao, J Stuart Bolton, Purdue University
5:00 p.m.	2015-01-2203	Modeling and Characterization of a Novel Porous Metallic Foam Inside Ducts Maaz Farooqui, Tamer Elnady, Ain Shams University; Ragnar Glav, Scania AB; Tony Karlsson, Scania CV AB
5:00 p.m.	2015-01-2239	Structural Damping by the Use of Fibrous Materials Nicholas N. Kim, Seungkyu Lee, J Stuart Bolton, Purdue University; Sean Hollands, Polytec Inc; Taewook Yoo, 3M
5:20 p.m.	2015-01-2258	Development of an Algorithm to Automatically Detect and Distinguish Squeak and Rattle Noises Gil-Jun Lee, University of Cincinnati; Kichang Kim, Hyundai Motor Co.; Jay Kim, University of Cincinnati

5:40 p.m. **2015-01-2261** **Modeling of Active and Passive Damping Patches with Application to a Transmission Casing Cover**
Joseph Plattenburg, Jason Dreyer, Rajendra Singh, Ohio State University

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00462, and also individually. To purchase visit collections.sae.org

Tuesday, June 23

Student Paper Judging (Group 3)

Session Code: **NVCSTP3**

Room Grand Gallery Room E

Session Time: **4:40 p.m.**

Moderators - *Eric Frank, Sound Answers Inc.; Thomas L. Lago, QirraSound Technologies Europe AB; Richard Kolano, Kolano and Saha Engineers Inc.; Christopher Shaw, Halla Visteon Climate Control Corp.*

Time	Paper No.	Title
4:40 p.m.	2015-01-2222	Active Control of Structure-Borne Road Noise Based on the Separation of Front and Rear Structural Road Noise Related Dynamics <i>Nikos Zafeiropoulos, University of Salford; Marco Ballatore, Bentley Motors Ltd.; Andy Moorhouse, Andy Mackay, University of Salford</i>
5:00 p.m.	2015-01-2226	Determination of the Transfer Matrix for Isolators Using Simulation with Application to Determining Insertion Loss <i>Shishuo Sun, David W. Herrin, John Baker, University of Kentucky</i>
5:20 p.m.	2015-01-2229	Comparative Assessment of Frequency Dependent Joint Properties Using Direct and Inverse Identification Methods <i>Benjamin Joodi, Scott Allen Noll, Jason Dreyer, Rajendra Singh, Ohio State University</i>
5:40 p.m.	2015-01-2308	A Comparison of the Transfer and Scattering Matrix Approaches for Determining Muffler Transmission Loss using the Two Load Method <i>Yitian Zhang, David W. Herrin, University of Kentucky</i>
6:00 p.m.	2015-01-2281	Virtual Dominant Sensor for Observability Improvement in Rotating Systems <i>Shrirang Deshpande, Randall Allemang, SDRL, University of Cincinnati</i>

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Wednesday, June 24

Business Perspectives Panel Discussion

Session Code: **NVC804**

Room Ballroom C

Session Time: **8:30 a.m.**

The purpose of this panel is to engage in dialogue on the challenges that face vehicle NVH development in light of headwinds from cost, new technologies and competing functional deliverables. Each panelist will provide a brief presentation. After some opening remarks they will be open to questions from the audience.

- Organizers -** Christopher Shaw, Halla Visteon Climate Control Corp.
- Moderators -** Barry Wyerman, Janesville Acoustics; Christopher Shaw, Halla Visteon Climate Control Corp.
- Panelists -** Jeff Orzechowski, Chrysler Group LLC; Todd Remtema, Toyota Technical Center USA Inc.; Vincent Paul Solferino, Ford Motor Company; Mark L. Stickler, Ford Motor Company; Thom Timmons, General Motors;

Wednesday, June 24

Intake / Exhaust (Part 1 of 3)

Session Code: NVC101

Room Ballroom C

Session Time: 10:00 a.m.

This session covers experimental, computational, and analytical efforts related to the basic mechanisms and control techniques of noise and vibration in the breathing system (induction, combustion chamber, and exhaust) of naturally aspirated and supercharged/turbocharged engines. Noise sources include airborne, flow, flow_zacoustic and flow_zstructure coupling.

Organizers - Raymond A. Kach, Ford Motor Co.; Philip Keller, BorgWarner Inc.; Ahmet Selamet, Ohio State University; Christopher Shaw, Visteon Climate Control

Time	Paper No.	Title
10:00 a.m.	2015-01-2314	Exhaust and Muffler Aeroacoustics Predictions using Lattice Boltzmann Method Adrien Mann, Min-Suk Kim, Barbara Neuhierl, Franck Perot, Robert Powell, Exa Corporation; Thomas Rose, Jan Krueger, Eberspaecher GmbH
10:20 a.m.	2015-01-2313	Coupled CFD and Vibro-Acoustic Modeling of Complex-Shaped Mufflers Accounting for Non-Uniform Mean Flow Effects Bryce Gardner, Abderrazak Mejdj, Chadwyck Musser, ESI US R&D; Sébastien Chaigne, ESI Group France; Tiago De Campos Macarios, ESI US R&D
10:40 a.m.	2015-01-2307	Effect of Aerodynamically Induced Pre-Swirl on Centrifugal Compressor Acoustics and Performance Neil Figurella, Ford Motor Co.; Rick Dehner, Ahmet Selamet, Ohio State University; Keith Miazgowicz, Ahsanul Karim, Ray Host, Ford Motor Co.
11:00 a.m.	2015-01-2305	The Effect of Phase Difference between Inputs on Insertion Loss for a Two-Inlet Muffler Xin Hua, Faurecia Emissions Control Technologies; David W. Herrin, Yitian Zhang, University of Kentucky
11:20 a.m.	2015-01-2316	Measurement and Simulation of Two-Inlet Single-Outlet Mufflers Weam Elshahar, Tamer Elnady, Ain Shams University
11:40 a.m.	2015-01-2315	Experimental Acoustic Characterization of Double-Inlet and Single-Outlet Muffler Giulio Lenzi, Giovanni Ferrara, Andrea Fioravanti, University of Florence

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Wednesday, June 24

Intake / Exhaust (Part 2 of 3)

Session Code: NVC101

Room Ballroom C

Session Time: 2:30 p.m.

This session covers experimental, computational, and analytical efforts related to the basic mechanisms and control techniques of noise and vibration in the breathing system (induction, combustion chamber, and exhaust) of naturally aspirated and supercharged/turbocharged engines. Noise sources include airborne, flow, flow_zacoustic and flow_zstructure coupling.

Organizers - Raymond A. Kach, Ford Motor Co.; Philip Keller, BorgWarner Inc.; Ahmet Selamet, Ohio State University; Christopher Shaw, Visteon Climate Control

Time	Paper No.	Title
2:30 p.m.	2015-01-2308	A Comparison of the Transfer and Scattering Matrix Approaches for Determining Muffler Transmission Loss using the Two Load Method Yitian Zhang, David W. Herrin, University of Kentucky
2:50 p.m.	2015-01-2310	Improving Tube Sound Transmission Loss Measurements Using the Transfer Matrix Technique to Remove the Effect of Area Changes Edward Ray Green, Sound Answers Inc.
3:10 p.m.	2015-01-2312	Numerical Determination of Transfer Impedance for Perforates P. Wang, J. Li, T. W. Wu, University of Kentucky
	2015-01-2309	Pressure Drop Characteristics of Perforated Pipes with Particular Application to the Concentric Tube Resonator (Written Only -- No Oral Presentation) David Neihguk, Mahindra & Mahindra Ltd.; M.L. Munjal, Indian Institute of Science; Abhinav Prasad, Mahindra & Mahindra Ltd.

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Wednesday, June 24

Intake / Exhaust (Part 3 of 3)

Session Code: NVC101

Room Ballroom C

Session Time: 4:40 p.m.

This session covers experimental, computational, and analytical efforts related to the basic mechanisms and control techniques of noise and vibration in the breathing system (induction, combustion chamber, and exhaust) of naturally aspirated and supercharged/turbocharged engines. Noise sources include airborne, flow, flow_zacoustic and flow_zstructure coupling.

Organizers - Raymond A. Kach, Ford Motor Co.; Philip Keller, BorgWarner Inc.; Ahmet Selamet, Ohio State University; Christopher Shaw, Visteon Climate Control

Time	Paper No.	Title
4:40 p.m.	2015-01-2306	Design Optimization of Vehicle Muffler Transmission Loss using Hybrid Method John G. Cherng, Weiwei Wu, University of Michigan; Peiran Ding, Mike Hebbes, Henry Zhang, ANSYS Inc.
5:00 p.m.	2015-01-2311	Development of Alternate Split Cat-Con - Muffler Configuration Solution for Front Engine Low Floor Bus Aditya Palsule, Arun Budama, Nandakumar Somasundaraeswer, Ashok Leyland Technical Center
	2015-01-2317	MAP: a Simulative Program for Acoustic Prediction and Analysis of Duct Muffling Systems (Written Only -- No Oral Presentation) Zhenlin Ji, Yiliang Fan, Harbin Engineering University

2015-01-2318 **Hanger Location Layout of Automotive Exhaust System (Written Only -- No Oral Presentation)**

Wang Wenzhu, Liu Gang, Cheng Mianhong, Shenyang Aerospace University; Wei Jun, Brilliance Auto R&D Center

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Wednesday, June 24

Sound Quality Workshop

Session Code: **NVCWK3**

Room Ballroom C

Session Time: **6:00 p.m.**

The purpose and orientation are to empower engineers to recognize and fully connect their innate hearing capabilities with interactive analytic tools to characterize, design and improve mobility-product sounds considering human perception. Ear training examples will be included. The workshop illustrates and trains the approach to issues by linking perception with technical measurements, including both conventional and psychoacoustic tools.

Organizers - *Wade R. Bray, HEAD acoustics Inc.*

Wednesday, June 24

Body Structure / Chassis - Analysis and Model Improvements (Part 1 of 2)

Session Code: **NVC200**

Room Ballroom D

Session Time: **8:30 a.m.**

This session covers static and dynamic issues in the body and chassis that contribute to noise and vibration problems in vehicles. Included in this session are modal studies, measurement and analysis methods, transfer path analysis, design guidelines, and recommended practices for noise and vibration control of the body and chassis.

Organizers - *Christian Fernholz, General Electric Aircraft Engines; Eric Frank, Sound Answers Inc.; Saeed J. Siavoshani, Siemens PLM Software*

Time	Paper No.	Title
8:50 a.m.	2015-01-2261	Modeling of Active and Passive Damping Patches with Application to a Transmission Casing Cover <i>Joseph Plattenburg, Jason Dreyer, Rajendra Singh, Ohio State University</i>
9:10 a.m.	2015-01-2265	Optimizing Body Panels for NVH Performance <i>Murali Balasubramanian, Ahmed Shaik, Chrysler India Automotive Pvt, Ltd.</i>
9:30 a.m.	2015-01-2266	Prediction of Airborne Sound Transmission into the Passenger Compartment <i>Andrzej Pietrzyk, Volvo Car Corporation</i>
	2015-01-2260	Prediction of Automotive Ride Performance Using Adaptive Neuro-Fuzzy Inference System and Fuzzy Clustering (Written Only -- No Oral Presentation) <i>Tianze Shi, Shuming Chen, Dengfeng Wang, Jilin University</i>

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Wednesday, June 24

Body Structure / Chassis - Test and Correlation to Analysis (Part 2 of 2)

Session Code: NVC200

Room Ballroom D

Session Time: 10:00 a.m.

This session covers static and dynamic issues in the body and chassis that contribute to noise and vibration problems in vehicles. Included in this session are modal studies, measurement and analysis methods, transfer path analysis, design guidelines, and recommended practices for noise and vibration control of the body and chassis.

Organizers - Christian Fernholz, General Electric Aircraft Engines; Eric Frank, Sound Answers Inc.; Saeed J. Siavoshani, Siemens PLM Software

Time	Paper No.	Title
10:00 a.m.	2015-01-2263	Door Closing Sound Quality Methodology - Airborne and Structural Path Contributions Saeed J. Siavoshani, Prasad Vesikar, Siemens PLM Software
10:20 a.m.	2015-01-2262	Improved Method for FRF Acquisition for Vehicle Body NVH Analysis Tom Knechten, Siemens Industry Software NV; Marius-Cristian Morariu, Morariu Consulting; PJG van der Linden, Siemens Industry Software NV
10:40 a.m.	2015-01-2267	Application of Experimental Transfer Path Analysis and Hybrid FRF-Based Substructuring Model to Structure-Borne Noise Youngha Kim, Choonhyu Kim, Jaewoong Lee, Sunggi Kim, SsangYong Motors Co.
	2015-01-2264	Durability Analysis of Motorcycle Front Fender through Virtual Simulation, on Road Testing and Laboratory Testing Using NVH Tool (Written Only -- No Oral Presentation) Rama Subbu, Baskar Anthonysamy, Piyush Mani Sharma, Hero Motocorp Limited

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Wednesday, June 24

Lightweight Design (Part 1 of 2)

Session Code: NVC305

Room Ballroom D

Session Time: 2:30 p.m.

The purpose of this session is to describe solutions for weight savings and to explain the NVH impact of these weight reductions. Weight savings can come from interior and structural parts of vehicle through various solutions of material selection to new dampening compounds. NVH countermeasures for these weight reduction solutions will be outlined so that lightweight design for next generation vehicles can be implemented with attention to noise and vibration throughout the vehicle.

Organizers - Yuksel Gur, Ford Motor Co.; Jian Pan, Autoneum North America Inc.; Alan Parrett, General Motors Co.; Saeed L. Siavoshani, Siemens PLM Software; Barry Robert Wyerman, Janesville Acoustics

Time	Paper No.	Title
2:30 p.m.	2015-01-2343	Sound Package Design for Lightweight Vehicles Jian Pan, Autoneum North America Inc.; Yuksel Gur, Ford Motor Co.
2:50 p.m.	2015-01-2339	Enhanced Acoustic Performance using Key Design Parameters of Headliners Márcio Calçada, Alan Parrett, General Motors Co.

- 3:30 p.m.** **2015-01-2345** **Vibro-Acoustic Properties of a Very Long Flax Fibers Reinforced Thermoset ζ Flaxpreg ζ Light Sandwich**
Arnaud Duval, Valérie Marcel, Ludovic Dejaeger, Francis Lhuillier, Moussa Khalfallah, Faurecia Acoustics And Soft Trim Div.
- 2015-01-2342** **A Lightweight Dash Insulator Development and Engineering Application for the Vehicle NVH Improvement (Written Only -- No Oral Presentation)**
Jun Zhang, Jian Pang, Siwen Zhang, Xiaoxuan Zhang, Congguang Liu, Changan Automobile Co., Ltd.

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Wednesday, June 24

Lightweight Design (Part 2 of 2)

Session Code: **NVC305**

Room Ballroom D

Session Time: **4:40 p.m.**

The purpose of this session is to describe solutions for weight savings and to explain the NVH impact of these weight reductions. Weight savings can come from interior and structural parts of vehicle through various solutions of material selection to new dampening compounds. NVH countermeasures for these weight reduction solutions will be outlined so that lightweight design for next generation vehicles can be implemented with attention to noise and vibration throughout the vehicle.

Organizers - *Yuksel Gur, Ford Motor Co.; Jian Pan, Autoneum North America Inc.; Alan Parrett, General Motors Co.; Saeed J. Siavoshani, Siemens PLM Software; Barry Robert Wyerman, Janesville Acoustics*

Time	Paper No.	Title
4:40 p.m.	2015-01-2344	Light-weight Liquid-Applied Sound Damping Material for Automotive Industry <i>Murteza T. Erman, Henkel Corporation</i>
5:00 p.m.	2015-01-2341	Lightweight and NVH Performance: New Solutions with High Performance Microcellular Polyurethanes. <i>Marc Ingelmann, Holger Bickelmann, BASF Polyurethanes GmbH</i>

Wednesday, June 24

The History and Future of Fourier Analysis Workshop

Session Code: **NVCWK4**

Room Ballroom D

Session Time: **6:00 p.m.**

Frequency analysis is often referred to as Fourier analysis but is that really true? The foundation is based on stationary and "Fourier signals." What happens if that is not the case? Modern FFT signal analyzers use very sparse sampling that is correct according to Shannon but what will happen when using time domain analysis. Many of the myths and frequent questions will be answered using a "user perspective" and rules of thumb will be given together with good methods to avoid large errors.

Organizers - *Thomas L. Lago, QirraSound Technologies Europe AB*

Presenters - *Thomas L. Lago, QirraSound Technologies Europe AB; Colin Mercer, Prosig, Ltd.*

Wednesday, June 24

Chat with the Experts

Session Code: NVCWC

Room Exhibit Hall

Session Time: 1:30 p.m.

Organizers - Thomas L. Lago, QirraSound Technologies Europe AB

Presenters - Wade R. Bray, HEAD acoustics Inc.; Peter W. Johnson, University of Washington; Daniel Maguire, Independent Consultant in Active Noise & Vibration Control; Thomas Reinhart, Southwest Research Institute

Wednesday, June 24

Driveline (Part 4 of 5)

Session Code: NVC103

Room Grand Gallery Room A

Session Time: 8:30 a.m.

This session deals with analytical, computational and experimental studies of the dynamic response including noise and vibration of automotive driveline system and components. Typical topics of interests include, but not limited to, torque converters, gear noise, axle noise driveline system dynamics, transmission noise and vibrations, powertrain dynamics, transient dynamic response and propshaft balancing.

Organizers - Hether Fedullo, Ford Motor Co.; Kiran Govindswamy, FEV Inc.; Teik C. Lim, Univ. of Cincinnati; Jeff Orzechowski, Chrysler Group LLC; Mohamad Qatu, Central Michigan Univ.; Joseph L. Stout, Ford Motor Co.; In-Soo Suh, KAIST

Time	Paper No.	Title
8:50 a.m.	2015-01-2179	Start-Up Transient Vibration Analysis of a Vehicle Powertrain System Equipped with a Nonlinear Clutch Damper Laihang Li, Rajendra Singh, Ohio State University
9:10 a.m.	2015-01-2189	Development of a Non-Linear Clutch Damper Experiment Exhibiting Transient Dynamics Michael Krak, Jason Dreyer, Rajendra Singh, Ohio State Univ.

Wednesday, June 24

Driveline (Part 5 of 5)

Session Code: NVC103

Room Grand Gallery Room A

Session Time: 10:00 a.m.

This session deals with analytical, computational and experimental studies of the dynamic response including noise and vibration of automotive driveline system and components. Typical topics of interests include, but not limited to, torque converters, gear noise, axle noise driveline system dynamics, transmission noise and vibrations, powertrain dynamics, transient dynamic response and propshaft balancing.

Organizers - Hether Fedullo, Ford Motor Co.; Kiran Govindswamy, FEV Inc.; Teik C. Lim, Univ. of Cincinnati; Jeff Orzechowski, Chrysler Group LLC; Mohamad Qatu, Central Michigan Univ.; Joseph L. Stout, Ford Motor Co.; In-Soo Suh, KAIST

Time	Paper No.	Title
10:00 a.m.	2015-01-2177	Dual Degree of Freedom Vibration Damper (DDVD) for Driveline Noise and Vibration Issue Resolution MR Vikram, General Motors Technical Centre India; Mark Gehringer, General Motors Co; Ramesh Patil, General Motors Technical Centre India

10:20 a.m.	2015-01-2180	Development of Refined Clutch-Damper Subsystem Dynamic Models Suitable for Time Domain Studies Almahdi Saleh, Michael Krak, Jason Dreyer, Rajendra Singh, Ohio State University
11:00 a.m.	2015-01-2187	Development of an End-of-Line Driveline System Balance Tester Mark A. Gehringer, General Motors Co.; Keith Thompson, Burke Porter Machinery
	2015-01-2176	Driveline Torsional Analysis and Parametric Optimization for Reducing Driveline Rattle (Written Only -- No Oral Presentation) Rajkumar Bhagate, Ajinkya Badkas, Kiran Mohan, Mahindra & Mahindra, Ltd.
	2015-01-2191	Torsional Vibration Modeling of Driveline System for EV Low-Frequency Flutter (Written Only -- No Oral Presentation) Peng Yu, Tong Zhang, Shiyang Chen, Jing Li, Rong Guo, Tongji Univ.
	2015-01-2192	Experimental Investigation of Effect of Driveline Torsional Fluctuations on Overall NVH Performance of the Vehicle (Written Only -- No Oral Presentation) Manchi Venkateswara Rao, Jos Frank, Mahindra & Mahindra, Ltd.; Prasath Raghavendran, Automotive OEM

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Wednesday, June 24

Wind Noise and Aeroacoustics (Part 1 of 3)

Session Code: NVC208

Room Grand Gallery Room A

Session Time: 2:30 p.m.

This session is to present numerical and experimental work pertaining to noise due to flow around the vehicle body, such as flow-induced interior noise, flow over protrusions, sunroofs, windows, noise from ventilation systems, or flow noise in exhaust system. Papers on aerodynamics alone without sound are excluded. Numerical studies may include new models or models based on existing theory as long as they are adequately supported by experimental or theoretical verifications.

Organizers - Robert Powell, Sivapalan Senthoran, Exa Corporation; Christopher Shaw, Visteon Climate Control

Time	Paper No.	Title
2:50 p.m.	2015-01-2325	Sideglass Turbulence and Wind Noise Sources Measured with a High Resolution Surface Pressure Array P. Bremner, AeroHydroPLUS; C. Todter, Keppel Professional Services Inc.; S. Clifton, TMR Pty. Ltd.
3:10 p.m.	2015-01-2329	Side Mirror Noise with Adaptive Spectral Reconstruction Paolo Di Francescantonio, Scientific & Technical Software; Charles Hirsch, Piergiorgio Ferrante, NUMECA International; Katsutomo Isono, NUMECA Japan
	2015-01-2324	Impact of Sunroof Deflector on Interior Sound Quality (Written Only - No Oral Presentation) Hangsheng Hou, Guiping Yue, FAW R&D Center

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Wednesday, June 24

Wind Noise and Aeroacoustics (Part 2 of 3)

Session Code: NVC208

Room Grand Gallery Room A

Session Time: 4:40 p.m.

This session is to present numerical and experimental work pertaining to noise due to flow around the vehicle body, such as flow-induced interior noise, flow over protrusions, sunroofs, windows, noise from ventilation systems, or flow noise in exhaust system. Papers on aerodynamics alone without sound are excluded. Numerical studies may include new models or models based on existing theory as long as they are adequately supported by experimental or theoretical verifications.

Organizers - Robert Powell, Sivapalan Senthoooran, Exa Corporation; Christopher Shaw, Visteon Climate Control

Time	Paper No.	Title
4:40 p.m.	2015-01-2331	Prediction of Interior Noise in a Sedan Due to Exterior Flow <i>Alexander Schell, Daimler AG; Vincent Cotoni, CD-adapco</i>
5:00 p.m.	2015-01-2321	Assessment of Broadband Noise Generated by a Vehicle Sunroof at Different Flow Conditions using a Digital Wind Tunnel <i>Nicholas Oettle, Jaguar Land Rover; Andrew Bissell, Sivapalan Senthoooran, Mohammed Meskine, Exa Corporation</i>
5:20 p.m.	2015-01-2330	Coupling CFD with Vibroacoustic FE Models for Vehicle Interior Low-Frequency Wind Noise Prediction <i>Christian Y. Glandier, Mark Eiselt, Oskar Prill, Eric Bauer, Daimler AG</i>

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Wednesday, June 24

Brakes Panel Discussion

Session Code: NVC201

Room Grand Gallery Room B

Session Time: 8:30 a.m.

This session provides a good overview of current issues and problem-solving activities in vehicle braking system noise. Braking noise is one of the highest dollars cost warranty issues for the automakers, and therefore, gets considerable attention. The papers of this session will describe both experimental and analytical programs of investigations related to this issue.

Organizers - James K. Thompson, NIOSH; Todd Eric Rook, UTC Aerospace Systems

Time	Paper No.	Title
	Panel	The SAE Brake NVH Committee's Future Initiatives for Brake Standards Panelists - Eric Denys, Wolverine Advanced Materials;
	Panel	Highway Truck Brake NVH Issues and Needs to Future Development Panelists - Craig Birkett, Navistar International Corp.;
	Panel	New Research and Technology Development in the Understanding and Control of Brake Noise Panelists - Jason T. Dreyer, Ohio State University;

Wednesday, June 24

Diesel

Session Code: NVC104

Room Grand Gallery Room B

Session Time: 10:00 a.m.

The diesel NVH session is focused on issues related to making diesel engines achieve better NVH characteristics. Topics include both analytical and experimental techniques for developing low noise diesel engines and components. Related topics covered in this session include linear and torsional vibration of diesel engines, as well as features intended to reduce diesel specific intake and exhaust noise problems, such as turbocharger whine.

Organizers - Kalyan Singh Bagga, Hether Fedullo, Ford Motor Co.; Dhanesh Purekar, Cummins Inc.; Thomas Reinhart, Southwest Research Institute; Christopher Shaw, Visteon Climate Control

Time	Paper No.	Title
10:00 a.m.	2015-01-2295	Powertrain Level Target Setting for Impulsive Noise based on Interior Noise Levels Aniket Parbat, Todd Tousignant, Kiran Govindswamy, FEV North America Inc.
10:20 a.m.	2015-01-2296	Characteristics of Diesel Engine Noise According to EGR Rate Change during Transient Operation Seunghyun Lee, Sungmoon Lee, Kyoungdoug Min, Seoul National Univ; Insoo Jung, Hyundai Motor Group
10:40 a.m.	2015-01-2297	Closed-Loop Control for Diesel Combustion Noise Using Engine Vibration Signals Insoo Jung, Jaemin Jin, Kwangmin Won, Seungwook Yang, Hyundai Motor Company; Kyoungdoug Min, Seoul National Univ; Hoimyung Choi, Advanced Institutes of Convergence Tech
11:00 a.m.	2015-01-2298	Analytical and Developmental Techniques Utilized in the Structural Optimization of a New Lightweight Diesel Engine Stephen Chittick, Mark Swindell, Samir Raorane, Jaguar Land Rover
11:20 a.m.	2015-01-2299	Round Robin Noise Measurement System Analysis Using Light Duty Diesel Engine Dhanesh Purekar, Cummins Inc.

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Wednesday, June 24

Interior Noise and Vibration Sources (Part 1 of 2)

Session Code: NVC205

Room Grand Gallery Room B

Session Time: 2:30 p.m.

This session covers noise and vibration sources and paths within a vehicle (automobiles, trucks and recreational vehicles). Example of noise sources included are HVAC system, electric motor powered mechanisms and door closure and example of vibration sources are road and engine. Also included are Whole Body and Hand Arm Vibration experienced by professional drivers as well as acoustical design factors of audio, infotainment, and hands free devices.

Organizers - Gabriella Cerrato, Sound Answers Inc.; Farokh Kavarana, Nissan Technical Center NA; Thomas L. Lago, QirraSound Technologies Europe AB; Prakash T. Thawani, DENSO International America Inc.

Time	Paper No.	Title
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2:30 p.m.	2015-01-2270	Numerical and Experimental Study of Sound Power Reduction Performance of Acoustic Black Holes in Rectangular Plates <i>Oliver Unruh, German Aerospace Center (DLR); Christopher Blech, TU Braunschweig; Hans Peter Monner, German Aerospace Center (DLR)</i>
2:50 p.m.	2015-01-2271	Objective Evaluation of Hold Feeling for Passenger Car Seats <i>Yong Du Jun, Bong Hyun Park, Kang Seok Seo, Kongju National University; Tae Hyun Kim, Myoung Jae Chae, Daewon Kang UP Co. Ltd.</i>
3:10 p.m.	2015-01-2274	Comparison of Vehicle Responses to Rumble Strip Inputs of Varying Design <i>Paul R. Donavan, Illingworth & Rodkin Inc.; Bruce Rymer, California Department of Transportation</i>

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Wednesday, June 24

Interior Noise and Vibration Sources (Part 2 of 2)

Session Code: NVC205

Room Grand Gallery Room B

Session Time: 4:40 p.m.

This session covers noise and vibration sources and paths within a vehicle (automobiles, trucks and recreational vehicles). Example of noise sources included are HVAC system, electric motor powered mechanisms and door closure and example of vibration sources are road and engine. Also included are Whole Body and Hand Arm Vibration experienced by professional drivers as well as acoustical design factors of audio, infotainment, and hands free devices.

Organizers - *Gabriella Cerrato, Sound Answers Inc.; Farokh Kavarana, Nissan Technical Center NA; Thomas L. Lago, QirraSound Technologies Europe AB; Prakash T. Thawani, DENSO International America Inc.*

Time	Paper No.	Title
4:40 p.m.	2015-01-2276	Flow-Induced Gurgling Noise in Automotive Refrigerant Systems <i>Zhengyu Liu, Donald Wozniak, Manfred Koberstein, Curtis Jones, Jan Xu, Suhas Venkatappa, Ford Motor Co.</i>
5:00 p.m.	2015-01-2275	Flow-Induced Whistle in the Joint of Thermal Expansion Valve and Suction Tube in Automotive Refrigerant System <i>Manfred Koberstein, Zhengyu Liu, Curtis Jones, Suhas Venkatappa, Ford Motor Co.</i>
5:20 p.m.	2015-01-2273	Prediction of Automotive Air-Handling System Flow Noise Sound Quality Using Sub-System Measurements <i>Curtis Jones, Zhengyu Liu, Suhas Venkatappa, James Hurd, Ford Motor Co.</i>

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Wednesday, June 24

Instrumentation Systems, Sensors and Methods

Session Code: NVC401

Room Grand Gallery Room C

Session Time: 10:00 a.m.

This session covers instrumentation sensors, systems and methods used in the measurement and analysis of noise and vibration. Analysis methods internal to instrumentation will also be covered.

Organizers - Wade R. Bray, HEAD acoustics Inc.; James M. Nieters, Sound Resources II LLC

Time	Paper No.	Title
10:00 a.m.	2015-01-2278	Methodology Development for Torsional Vibration Measurement and Processing in Powertrains Rohit Ravindran, Debajit Das, Keval Kamani, P Sivaraman, Gyan Arora, Ashok Leyland Ltd.
10:20 a.m.	2015-01-2281	Virtual Dominant Sensor for Observability Improvement in Rotating Systems Shrirang Deshpande, Randall Allemang, SDRL, University of Cincinnati
10:40 a.m.	2015-01-2280	Parameterizing Mount Models from In-Situ Measurements Bernd Philippen, Roland Sottek, Head acoustics GmbH
11:00 a.m.	2015-01-2279	A Unique Noise & Vibration Software Tool for Automotive Troubleshooting Giovanni Rinaldi, Chris Moon, Bret Engels, Sound Answers Inc.
11:20 a.m.	2015-01-2283	Accuracy and Limitations of Using an iOS Device for Noise and Vibration Measurements (Written Only -- No Oral Presentation) Andrew Smith, Studio Six Digital LLC
11:40 a.m.	2015-01-2282	Application of a New Perceptually-Accurate Tonality Assessment Method Roland Sottek, HEAD acoustics GmbH; Wade Bray, HEAD acoustics Inc
	2015-01-2284	Instrumentation, Acquisition and Data Processing Requirements for Accurate Combustion Noise Measurements (Written Only -- No Oral Presentation) Chris Hocking, Simon Antonov, Ford Motor Co.; Arsham Shahlari, University of Wisconsin

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Wednesday, June 24

Subjective Response (Part 1 of 2)

Session Code: NVC303

Room Grand Gallery Room C

Session Time: 2:30 p.m.

This session covers subjective testing and analysis related to automotive noise and vibration, usually referred to as sound quality and vibration quality. The focus is on both subjective and objective tools and methods that can be used either to design sound or vibration quality into the automotive product, or to characterize and eliminate undesired sounds or vibrations.

Organizers - Daniel Rauchholz, UGN Inc.; Steve Sorenson, E-A-R Thermal Acoustic Systems

Chairpersons - Steve Sorenson, E-A-R Thermal Acoustic Systems; Daniel Rauchholz, UGN Inc

Time	Paper No.	Title
2:30 p.m.	2015-01-2337	Automotive Speech Intelligibility Measurements Gordon Ebbitt, Todd Remtema, Toyota Technical Center USA Inc.

2:50 p.m.	2015-01-2335	Quantifying Hands-Free Call Quality in an Automobile Scott Amman, Francois Charette, Paul Nicastrì, John Huber, Brigitte Richardson, Gint Puskorius, Yuksel Gur, Anthony Coopriider, Ford Motor Co.
3:10 p.m.	2015-01-2333	Perception of Diesel Engine Gear Rattle Noise Brandon Sobecki, Patricia Davies, J Stuart Bolton, Purdue University; Frank Eberhardt, Cummins Inc.
3:30 p.m.	2015-01-2336	Automobile Powertrain Sound Quality Development Using a Design for Six Sigma (DFSS) Approach Anastasios Arvanitis, Jeff Orzechowski, FCA US LLC; Todd Tousignant, Kiran Govindswamy, FEV North America, Inc.

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Wednesday, June 24

Subjective Response (Part 2 of 2)

Session Code: NVC303

Room Grand Gallery Room C

Session Time: 4:40 p.m.

This session covers subjective testing and analysis related to automotive noise and vibration, usually referred to as sound quality and vibration quality. The focus is on both subjective and objective tools and methods that can be used either to design sound or vibration quality into the automotive product, or to characterize and eliminate undesired sounds or vibrations.

Organizers - Daniel Rauchholz, UGN Inc.; Steve Sorenson, E-A-R Thermal Acoustic Systems

Chairpersons - Steve Sorenson, E-A-R Thermal Acoustic Systems; Daniel Rauchholz, UGN Inc

Time	Paper No.	Title
4:40 p.m.	2015-01-2332	Development of a Cable Model for Virtual Shift Feeling Evaluation Jan Deleener, Siemens Industry Software; Akira Sekitou, Masanori Ohta, Nissan Motor Co Ltd
5:00 p.m.	2015-01-2334	Idle Vibration Analysis and Evaluation Utilizing a Full-Vehicle NVH Simulator David Bogema, Gary Newton, Bruel & Kjaer North America Inc.; Mark Stickler, Chris Hocking, Ford Motor Co.; Frank Syred, Sound & Vibration Technology Ltd.
	2015-01-2338	In-Vehicle Whine Perception based on Psychoacoustics and Some Design Principles (Written Only -- No Oral Presentation) Dong Guo, Quan Shi, Chongqing University of Technology; Peng Yi, Chong Qing Academy of Science and Technology

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Wednesday, June 24

SEA (Statistical Energy Analysis) Design

Session Code: NVC601

Room Grand Gallery Room D

Session Time: 10:00 a.m.

This session provides a good overview of recent innovations to SEA modeling techniques. SEA models can be used alone or together with hybrid analytical or experimental techniques to establish good comparative NVH predictions at the earliest stage of the vehicle design process. The papers of this session will describe recent advances and / or validations of SEA theory, applications, or use in conjunction with hybrid techniques for high- and mid-frequency NVH predictions.

Organizers - Mark Moeller; Chadwyck Musser, ESI US R&D; Jian Pan, Autoneum North America Inc.; Alan Parrett, General Motors Co.

Time	Paper No.	Title
10:00 a.m.	2015-01-0664 *	Establishment of Performance Design Process for Vehicle Sound-Roof Packages Based on SEA Method Hiroko Tada, Honda R&D Co., Ltd.
10:20 a.m.	2015-01-2302	Sound Package Development for Lightweight Vehicle Design using Statistical Energy Analysis (SEA) Yuksel Gur, Ford Motor Co.; Jian Pan, Autoneum North America Inc.; David Wagner, Ford Motor Co.
10:40 a.m.	2015-01-2301	Operational Determination of Car Window Damping Maxwell Hill, Dan Luo, Mark Moeller, Tufts University
11:00 a.m.	2015-01-2303	Headliner Absorption Parameter Prediction and Modeling Katherine Tao, Alan Parrett, David Nielubowicz, General Motors Co.
11:20 a.m.	2015-01-2300	Interior Noise Design of a Light Rail Vehicle Using Statistical Energy Analysis Robert Fiedler, Mecas ESI s.r.o.; Chadwyck Musser, ESI US R&D; Petr Cuchý, Skoda Transportation a.s.
11:40 a.m.	2015-01-2241	Reciprocal Measurements of the Vehicle Transfer Function for Road Noise Hiromichi Tsuji, Shinichi Maruyama, Koichi Onishi, Nissan Motor Co., Ltd.

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* Previously published and/or presented at the SAE 2015 World Congress & Exhibition

Wednesday, June 24

Drive-By Noise

Session Code: NVC207

Room Grand Gallery Room D

Session Time: 2:30 p.m.

This session covers noise sources, measurement techniques, noise attenuation strategies, case studies, prediction and modeling methods, and community regulations related to drive-by noise.

Organizers - Paul R. Donovan, Illingworth & Rodkin Inc.; Ken Kicinski, Harley-Davidson Inc.; Richard Schumacher

Time	Paper No.	Title
2:30 p.m.	2015-01-2319	Developing a Car to Meet New Pass-By Noise Requirements using Simulation and Testing Uije Kim, Hyundai Motor Group; Matthew Maunder, Phil Grant, Duncan Mawdsley, Ricardo UK Limited
2:50 p.m.	2015-01-2320	Blind Source Separation Applied to Indoor Vehicle Pass-By Measurements Andreas Schuhmacher, Brüel & Kjaer Sound & Vibration A/S

Wednesday, June 24

Facilities

Session Code: NVC400

Room Grand Gallery Room D

Session Time: 4:40 p.m.

This session is focused on the development and application of facilities to conduct noise and vibration measurements. The intent is to provide practical information on the engineering challenges to consider in the construction and/or adaptation of a facility to the specialized noise and vibration requirements.

Organizers - Christopher Thomas Griffen, Material Sciences Corp.; James K. Thompson, NIOSH

Time	Paper No.	Title
4:40 p.m.	2015-01-2346	Evaluating Vibrational Behavior of Coupled Dynamic Systems in Engine Test Cells Balakumar Swaminathan, ACS
5:00 p.m.	2015-01-2347	Dynamic Decoupling of Driveline Dynamics from NVH Driveline Dynamometer: an Industry Sponsored Senior Design Project James A. Mynderse, Lawrence Technological University; Alexander Sandstrom, Zhaohui Sun, American Axle & Mfg Inc
5:20 p.m.	2015-01-2348	An Automotive Technical Center Quiet Room Improvement Study - Part I Richard Kolano, Kolano and Saha Engineers Inc.

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Thursday, June 25

Muffler and Silencer Design Workshop

Session Code: NVCWK6

Room Ballroom C

Session Time: 8:30 a.m.

In this workshop, a design process for mufflers is offered. Steps that may be taken during the 1) clarification of task, 2) conceptual design, 3) detailed design, and 4) prototyping phases are outlined, and the process is demonstrated at each step for a cross-flow type muffler. Basics and tips for both plane wave analysis and numerical simulation are discussed. Measurement of transmission loss using the two-load method will be described and demonstrated using a transmission loss test bench.

Organizers - Tamer Elnady, David W. Herrin, Univ. of Kentucky; Andy Seybert, Spectronics Inc.; Tim Wu, Univ. of Kentucky

Thursday, June 25

Structural Analysis: Engine / Powertrain / Driveline

Session Code: NVC100

Room Ballroom C

Session Time: 10:30 a.m.

The focus of the Structural Analysis session is to share experiences on analyzing, testing, and developing solutions to structural noise and vibration problems from powertrain sources. Analytical modeling, experimental testing and predictive correlation are just a few of the tools used in this endeavor.

Organizers - Joseph L. Stout, Abdelkrim Zouani, Ford Motor Co.; Jeff Orzechowski, Chrysler Group LLC; Todd Tousignant, FEV Inc.

Time	Paper No.	Title
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10:30 a.m.	2015-01-2288	NVH Development of the Ford 2.7L 4V-V6 Turbocharged Engine <i>Abdelkrim Zouani, Joseph Stout, Salah Hanim, Changshen Gan, Gabriela Dziubinski, William Baldwin, Zhi Fu, Ford Motor Co.</i>
10:50 a.m.	2015-01-2289	Powerplant NVH Decision Making Using Combined Airborne and Structureborne Noise Sources <i>Joseph L. Stout, Vincent Solferino, Simon Antonov, Ford Motor Co.</i>
11:10 a.m.	2015-01-2287	Torsional Vibration Analysis of Powertrain and Driveline Using Finite Element Method <i>Yaqiong Deng, Yanjing Zhao, Xiandi Zeng, Foton Motors Inc.</i>
11:30 a.m.	2015-01-2292	Development of an Optimization Process for Engine NVH Performance <i>Xiaorui Lu, Junda Ma, Brilliance Automotive Co., Ltd.</i>
	2015-01-2290	Computational Simulation to Validate Resonator through Bending Moment (Written Only -- No Oral Presentation) <i>Sivanandi Rajadurai, Guru Prasad Mani, Kavin Raja, Sundaravadivelu Mohan, Sharda Motor Industries Ltd. - R&D</i>
	2015-01-2291	Vibration Reduction of Single Cylinder Diesel Engine used for Agricultural Water Pumping (Written Only -- No Oral Presentation) <i>Pandurang Maruti Jadhav, Tata Technologies, Ltd.; Sandesh A Dunung, Rocket Engineering Corporation Pvt Ltd.; Pravin T Nitnaware, D Y Patil College of Engineering, Pune</i>
	2015-01-2293	NVH Analysis of Powertrain Start/Stop Transient Phenomenon by using Wavelet Analysis and Time Domain Transfer Path Analysis (Written Only -- No Oral Presentation) <i>Manchi Venkateswara Rao, S Nataraja Moorthy, Mahindra & Mahindra, Ltd.; Prasath Raghavendran, Automotive OEM</i>
	2015-01-2294	Concept Phase Powertrain Development for NVH Using the Optimization Technique (Written Only -- No Oral Presentation) <i>Kodali Ajay Krishna, Pankaj Bhardwaj, Sanjeevgouda Patil, Mansinh Kumbhar, Mahindra & Mahindra, Ltd.</i>

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Thursday, June 25

Structure Borne NVH Workshop

Session Code: NVCWK5

Room Ballroom D

Session Time: 8:30 a.m.

The Structure Borne NVH Workshop will root you in the fundamentals of Source-Path-Receiver Principles. A refined theoretical foundation covers the basics of low-frequency NVH, below 100 Hz, and mid-frequency, up to 500 Hz with guidelines for performance achievement. The New Tech section will overview the motivations and approaches for stochastic simulation, and its implications to NVH performance and efforts for test/CAE validation.

Organizers - Alan E. Duncan, Automotive Analytics Inc.; Gregory Goetchius, Atieva USA Inc.; Jianmin Guan, Altair Engineering Inc.

Thursday, June 25

Hybrid and Electric Vehicles

Session Code: NVC700

Room Ballroom D**Session Time: 10:30 a.m.**

This session discusses the noise sources, noise signatures, noise control strategy, and NVH technology unique to electric and hybrid powered vehicles. It is intended to bring a greater awareness of the NVH characteristics of these new vehicles to all NVH practitioners. At the same time, it will provide a forum so that advances in power systems, drive trains, batteries, and energy storage can be addressed with appropriate NVH technology as needed.

Organizers - Kiran Govindswamy, FEV Inc.; Saeed J. Siavoshani, Siemens PLM Software; In-Soo Suh, KAIST; Barry Robert Wyerman, Janesville Acoustics

Time	Paper No.	Title
10:30 a.m.	2015-01-2362	Vehicle NVH Evaluations and NVH Target Cascading Considerations for Hybrid Electric Vehicles <i>Todd Tousignant, Kiran Govindswamy, FEV North America, Inc.; Mark Stickler, Ming-Ran Lee, Ford Motor Company</i>
10:50 a.m.	2015-01-2364	Analysis of Motor Vibration Isolation System with Focus on Mount Resonances for Application to Electric Vehicles <i>Xianpai Zeng, Jared Liette, Scott Noll, Rajendra Singh, Ohio State University</i>
11:10 a.m.	2015-01-2365	Geartrain Noise Optimization in an Electrical Drive Unit <i>Zhaohui Sun, Glen Steyer, Jason Ley, American Axle & Mfg Inc.</i>
11:30 a.m.	2015-01-2363	Methods for Measuring, Analyzing and Predicting the Dynamic Torque of an Electric Drive Used in an Automotive Drivetrain <i>Albert Albers, Jan Fischer, Matthias Behrendt, IPEK; Dirk Lieske, Daimler AG</i>
	2015-01-2367	Interior Sound of Today's Electric Cars: Tonal Content, Levels and Frequency Distribution (Written Only -- No Oral Presentation) <i>David Lennström, Volvo Car Corporation; Arne Nykänen, Luleå University of Technology</i>

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Thursday, June 25**Wind Noise and Aeroacoustics (Part 3 of 3)****Session Code: NVC208****Room Grand Gallery Room A****Session Time: 10:30 a.m.**

This session is to present numerical and experimental work pertaining to noise due to flow around the vehicle body, such as flow-induced interior noise, flow over protrusions, sunroofs, windows, noise from ventilation systems, or flow noise in exhaust system. Papers on aerodynamics alone without sound are excluded. Numerical studies may include new models or models based on existing theory as long as they are adequately supported by experimental or theoretical verifications.

Organizers - Robert Powell, Sivapalan Senthoooran, Exa Corporation; Christopher Shaw, Visteon Climate Control

Time	Paper No.	Title
10:30 a.m.	2015-01-2326	Combining Modeling Methods to Accurately Predict Wind Noise Contribution <i>Denis Blanchet, Anton Golota, ESI Group</i>

10:50 a.m.	2015-01-2328	From Exterior Wind Noise Loads to Interior Cabin Noise: A Validation Study of a Generic Automotive Vehicle Barbara Neuhierl, Sivapalan Senthoooran, Exa Corporation; Reinier Toppinga, Anke Jäger, Daimler AG; Maarten Brink, Timo Lemke, Porsche AG; Philippe Moron, Raghu Mutnuri, Exa Corporation
11:10 a.m.	2015-01-2322	Numerical Simulation of Noise Transmission from A-pillar Induced Turbulence into a Simplified Car Cabin Bastien Ganty, Jonathan Jacqmot, Ze Zhou, Free Field Technologies; ChanHee Jeong, MSC Software
11:30 a.m.	2015-01-2323	Flow-Induced Noise Optimization of SUV HVAC System using a Lattice Boltzmann Method Abdelhakim Aissaoui, Exa Corporation; Ravindra S Tupake, Vilas Bijwe, Tata Motors, Ltd.; Mohammed Meskine, Franck Perot, Alain Belanger, Exa Corporation; Rohit J Vaidya, Tata Motors, Ltd.
	2015-01-2327	Internal Pressure Characteristics when Evaluating Dynamic Door Blow Out Deflection (Written Only -- No Oral Presentation) Hangsheng Hou, Wei Zhao, Jian Hou, FAW R&D Center

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Thursday, June 25

Mounts and Shock Absorbers

Session Code: NVC206

Room Grand Gallery Room B

Session Time: 10:30 a.m.

This session includes papers in the areas of static, dynamic, and fatigue characterization of elastomers, bushings, mounts and shock absorbers used in the mobility industry. Particular emphasis is given to new and innovative analysis and testing methodologies to quantify the non-linear properties of these systems in addition to the effects of temperature, frequency, and aging. Papers dealing with specific applications and case studies of existing methodologies are also welcome.

Organizers - Mohamad Qatu, Central Michigan Univ.; Saeed J. Siavoshani, Siemens PLM Software

Time	Paper No.	Title
10:30 a.m.	2015-01-2351	Test Method, Simulation and Micro-process Dynamic Model for Noise Analysis of Auto Hydraulic Shock Absorber Hongyu Shu, Shuang Luo, Li Wang, Chongqing University
10:50 a.m.	2015-01-2353	Physical 1-D System Simulation Model for Monotube Shock Absorbers for Simulation with Excitation up to 70Hz Jan Bunthoff, Daimler AG; Frank Gauterin, Karlsruhe Institute of Technology; Christoph Boehm, Daimler AG
11:10 a.m.	2015-01-2354	Design of Powertrain Mounting System for Engine with Three Cylinders Xiao-Ang Liu, South China University of Technology; Zhaoping Lv, TDC, SAIC GM Wuling Automobile Co., Ltd.; Wenbin Shangguan, South China University of Technology
11:30 a.m.	2015-01-2355	Dynamic Analysis of Hydraulic Bushings with Measured Nonlinear Compliance Parameters Luke Fredette, Jason Dreyer, Rajendra Singh, Ohio State University

- 2015-01-2352** **Reduction of Idle Shake in a Small Commercial Vehicle (Written Only -- No Oral Presentation)**
Chaitanya Krishna Balla, Sudhakara Naidu, Milind Narayan Ambardekar, Tata Motors, Ltd.
- 2015-01-2368** **Idle Shake Simulation and Optimization through Digital Car Model (Written Only -- No Oral Presentation)**
Babitha Kalla, Sanjeevgouda Patil, Mansinh Kumbhar, Mahindra & Mahindra Ltd.

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Thursday, June 25

Noise Path Analysis

Session Code: **NVC304**

Room Grand Gallery Room C

Session Time: **10:30 a.m.**

This session is dedicated to the tools and methodology involved in identifying, calculating and modifying various noise and vibration sources and paths in vehicles, aircraft and various consumer products and assist in the design and validation of noise and vibration targets

Organizers - *David Bogema, Bruel & Kjaer North America Inc.; Todd Freeman, Sound Answers Inc.; Gary Newton, Bruel & Kjaer North America Inc.*

Time	Paper No.	Title
10:30 a.m.	2015-01-2356	A Parametric Investigation of Louvered Terminations for Rectangular Ducts <i>Huangxing Chen, David W. Herrin, University of Kentucky</i>
10:50 a.m.	2015-01-2357	Transfer Path Analysis with the Coherent Operational Forces Estimated from the Responses <i>Hiromichi Tsuji, Kimihiko Nakano, University of Tokyo</i>
11:10 a.m.	2015-01-2358	Acoustic Diagnostic Network Algorithms, their Description and Implementation from Concept into a Comprehensive Vehicle Optimization Program. <i>Rod Morris-Kirby, Evan Harry, Dirk Jaeger, Bernd Borgmann, HP Pelzer Holding GmbH</i>
11:30 a.m.	2015-01-2359	Sound Power Measurement in a Semi-Reverberant, Volume Deficient Chamber <i>Craig Reynolds, Jason Blough, Carl Anderson, Mark Johnson, Michigan Technological University; Jean Schweitzer, GM Powertrain</i>
11:50 a.m.	2015-01-2360	Source-Path-Contribution Methodologies across a Wide Range of Product Types <i>Todd Freeman, Gabriella Cerrato, Sound Answers Inc.</i>
	2015-01-2361	Low-Frequency Noise Transfer Path Identification Study for Engine Sub-Frame Utilizing Numerical Simulation (Written Only -- No Oral Presentation) <i>Sajjad Beigmoradi, R & D Center of SAIPA (AIRIC)</i>

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Thursday, June 25

Buzz, Squeak and Rattle

Session Code: NVC204

Room Grand Gallery Room D

Session Time: 10:30 a.m.

This session is focused on the vehicle body interior noise issues caused by friction and/or impact due to the vibration of interfacing components. The papers in this session will investigate those issues through the best practice of analytical and experimental applications.

Organizers - Ivanna G. Malinow, ZF TRW Active & Passive Safety Technology; Gary Newton, Bruel & Kjaer North America Inc.

Time	Paper No.	Title
10:30 a.m.	2015-01-2259	How to Measure, Prevent, and Eliminate Stick-Slip and Noise Generation with Lubricants <i>Jan Zuleeg, Klüber Lubrication München SE & Co. KG</i>
10:50 a.m.	2015-01-2257	A Case Study: Application of Analytical and Numerical Techniques to Squeak and Rattle Analysis of a Door Assembly <i>Ki-Chang Kim, Sang-Woo Lee, Seok-Gil Hong, Hyundai Motor Co.; Jay Kim, Gil-Jun Lee, University of Cincinnati; Jae Min Choi, Yong-Jin Kim, VP Korea Inc.</i>
11:10 a.m.	2015-01-2258	Development of an Algorithm to Automatically Detect and Distinguish Squeak and Rattle Noises <i>Gil-Jun Lee, University of Cincinnati; Kichang Kim, Hyundai Motor Co.; Jay Kim, University of Cincinnati</i>
11:30 a.m.	2015-01-2246	Development of a Portable Acoustic Beamformer using FPGA Technology and Digital Microphones <i>Kurt Veggeberg, Mike Denton, National Instruments</i>
11:50 a.m.	Panel	Panel Discussion: Beamforming as a Diagnostic Tool to Solve BSR Problems in Vehicles Moderators - Ivanna G. Malinow, ZF TRW Active & Passive Safety Technology
	Panel	Beamforming Considerations for Automotive Noise Diagnostics Panelists - Dan Domme, Polytec Inc.;
	Panel	Using Real-Time Beamforming in Locating Squeak and Rattle Events Panelists - James Knittel, HEAD acoustics Inc.;
	Panel	Using Spherical Beamforming Technique for Identifying Buzz, Squeak and Rattle in Car Cabin Panelists - Karim Haddad, Bruel & Kjaer Sound/Vib Meas A/S;

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Thursday, June 25

Product Development Process (All Written Only)

Session Code: NVC500

Room TBD

Session Time:

This session focuses on the development process used to achieve NVH goals and includes topics such as benchmarking, target setting, target cascading, the role and timing of simulation methods and test methods and cross functional coordination and optimization. Papers in this session will also explore the relevance and timing of component, subsystem and full system analysis and testing.

Organizers - Robert Powell, Exa Corporation; Pranab Saha, Kolano and Saha Engineers Inc.

Time

Paper No.

Title

2015-01-2285

Car Ride Before Entering the Lab Increases Precision in Listening Tests (Written Only -- No Oral Presentation)

Arne Nykänen, Luleå University of Technology; David Lennström, Volvo Car Corporation; Roger Johnsson, Luleå University of Technology

Thursday, June 25

Written Only

Session Code:

NVC999

Room TBD

Session Time:

Time

Paper No.

Title

2003-01-1589

Automotive Noise and Vibration Control Practices in the New Millennium

*

Barry Wyerman, Lear Corp.; Mike Dinsmore, Carcoustics USA; Pranab Saha, Kolano and Saha Engineers, Inc; Bob Baker, General Motors Corp.; Anita Carey; Rod Hadi, Vibracoustics, Inc.

951375

Application of Noise Control and Heat Insulation Materials and Devices in the Automotive Industry (Written Only -- No Oral Presentation)

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