

60TH MEETING OF THE ACOUSTIC EMISSION WORKING GROUP



AEWG-60

Program & Abstracts

June 19 & 20, 2018
The Mills House Hotel
Charleston, South Carolina, USA

Hosted by



UNIVERSITY OF
SOUTH CAROLINA
College of Engineering
and Computing

www.aewg.org

WORD OF WELCOME

Dear participant,

It is with great pleasure that we welcome you to the 60th meeting of the Acoustic Emission Working Group in the historic city of Charleston.

AEWG provides opportunities for all having interest in acoustic emission to meet and discuss ongoing research and development in the field of Acoustic Emission (AE). We are very happy to have received so many high-level abstracts from around the world representing cutting-edge research on interpretation of acoustic emission data, advancements in instrumentation, and developing applications.

The meeting is organized in four technical sessions representing the following topics:

- Infrastructure
- Aerospace & Composites
- Sensors/Sensing/Signal Analysis/Modeling
- Fatigue/Fracture

As in previous meetings, manufacturers and vendors have opportunities to present their latest developments during the commercial presentations.

Being the 60th meeting (the first was held in Idaho Falls on February 8, 1968), we are delighted to welcome two keynote speakers to our program: Mr. Lee Floyd, former State Bridge Maintenance Engineer at the South Carolina Department of Transportation and Dr. Kanji Ono, Professor Emeritus of the University of California Los Angeles. We look forward to their presentations.

We offer a special thank you to our sponsors, who are listed on the back page of this program brochure. Without their financial support we would have not been able to organize the event.

We would also like to acknowledge the guidance and assistance that we received from the AEWG Executive Board, in particular Chairman Dr. David Kosnik (CTL Group) and Secretary Dr. Didem Ozevin (University of Illinois at Chicago). Thank you for your support.

We thank you for your participation and wish you a productive and meaningful AEWG-60 meeting!



Paul Ziehl

Host & Program Chair

AEWG-60 PROGRAM COMMITTEE

HOST & PROGRAM CHAIR

Dr. Paul Ziehl

Assistant Dean for Research, College of Engineering and Computing
Professor, Department of Civil and Environmental Engineering
University of South Carolina

AEWG EXECUTIVE COMMITTEE

Chairman: **Dr. David Kosnik**, CTLGroup

Vice-Chairman: **Prof. Didem Ozevin**, University of Illinois at Chicago

Secretary: **Dr. Valery Godinez-Azcuaga**, MISTRAS Group

Past-Chairman: **Prof. Gary Qi**, University of Memphis

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LOCAL MEETING ORGANIZING COMMITTEE

University of South Carolina

Tanja van Tooren, Industrial Coordinator for Capstone Projects, College of Engineering and Computing

Jenna Ferguson, Conference and Events Manager, Continuing Education and Conferences

Sarah Long, Business Manager, Continuing Education and Conferences

LOGISTICS

Meeting Location: The Mills House Hotel, 115 Meeting St, Charleston, SC 29401
 T: (843) 577-2400
 W: www.millshouse.com

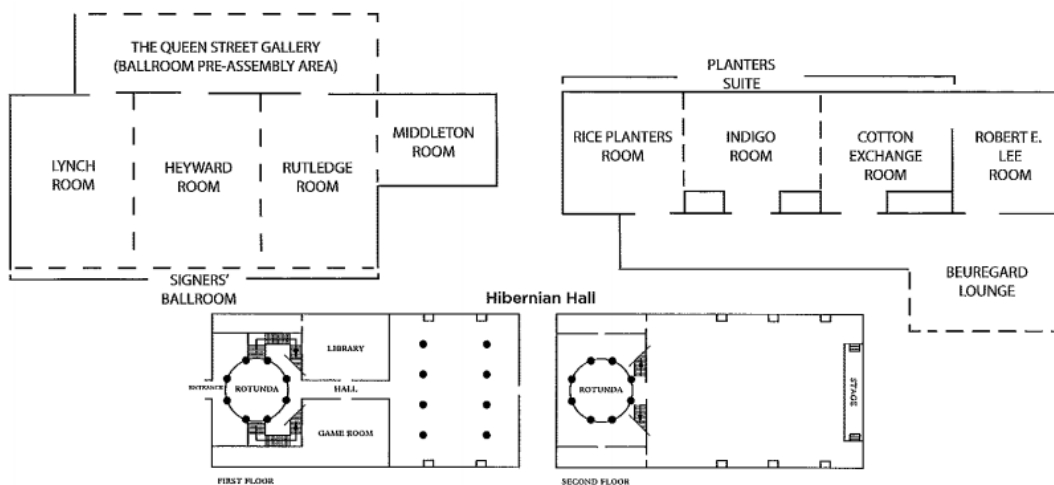
Meeting Room: Rutledge/Heyward Room (1st Floor)
Exhibitors: Queen Street Gallery (1st Floor)
Breakfast/Breaks: Queen Street Gallery (1st Floor)
Lunch: Barbadoes Room (1st Floor)
Receptions: Meeting Street Terrace (2nd floor)
Awards Dinner: Planters Suite (2nd floor)

Contact Person: Ms. Tanja van Tooren, e-mail: tanja@cec.sc.edu, cell: +1 (803) 445-5261
 Dr. Paul Ziehl, e-mail: ZIEHL@cec.sc.edu, cell: +1 (803) 803 467-4030

Registration: You can pick-up your registration badge during the following periods at Queen Street Gallery in front of the Rutledge/Heyward Room (1st Floor):
 Monday, June 18: 3:00 – 5:00 PM
 Tuesday, June 19: 7:00 – 9:00 AM, 12:00 – 2:00 PM
 Wednesday, June 20: 7:00 – 9:00 AM

WIFI Access Network: CEC2018
 Username: CEC2018
 Password: 06192018
 Only available during meeting hours in the meeting room.

FLOORPLAN




THE MILLS HOUSE
 Wyndham Grand Hotel

115 Meeting Street
 Historic Charleston, South Carolina 29401
 Phone: 1-800-874-9600 Fax: 843-722-2112

WYNDHAM.COM or 1-800-WYNDHAM
www.millshouse.com

PROGRAM AT A GLANCE

Monday, June 18		
15:00 – 17:00	Registration & Build-up for Sponsors and Exhibitors	Queen Street Gallery
17:00 – 19:00	Welcome Reception	Meeting Street Terrace
Tuesday, June 19		
7:00 – 17:00	Exhibitors	Queen Street Gallery
7:00 – 8:00	Breakfast & Registration	Queen Street Gallery
8:00 – 8:10	Welcome & Opening	Rutledge/Heyward Room
8:10 – 8:40	Keynote	Rutledge/Heyward Room
8:40 – 10:00	Technical Session I	Rutledge/Heyward Room
10:00 – 10:30	Morning Break <i>(Awards Committee Meeting)</i>	Queen Street Gallery
10:30 – 12:10	Technical Session II	Rutledge/Heyward Room
12:10 – 13:10	Lunch <i>(Executive Committee Meeting)</i>	Barbadoes Room
13:10 – 14:30	Commercial Presentations	Rutledge/Heyward Room
14:30 – 15:50	Technical Session III	Rutledge/Heyward Room
15:50 – 16:20	Afternoon Break <i>(IIIAE Board Meeting)</i>	Queen Street Gallery
16:20 – 17:20	Technical Session IV	Rutledge/Heyward Room
17:20	Adjourn for the day	
18:00 – 18:45	Walking Tour Charleston	Meet in Courtyard
	Dinner on your own	
Wednesday, June 20		
7:00 – 17:00	Exhibitors	Queen Street Gallery
7:00 – 8:00	Breakfast & Registration	Queen Street Gallery
8:00 – 8:35	Opening & Keynote	Rutledge/Heyward Room
8:35 – 10:15	Technical Session V	Rutledge/Heyward Room
10:15 – 10:45	Morning Break	Queen Street Gallery
10:45 – 12:05	Technical Session VI	Rutledge/Heyward Room
12:05 – 13:05	Lunch	Barbadoes Room
13:05 – 14:05	Business Meeting	Rutledge/Heyward Room
14:05 – 15:45	Technical Session VII	Rutledge/Heyward Room
15:45 – 16:15	Afternoon Break	Queen Street Gallery
16:15 – 17:55	Technical Session VIII	Rutledge/Heyward Room
17:55 – 18:00	Closing	Rutledge/Heyward Room
18:00	Adjourn	
18:00 – 19:00	Reception	Meeting Street Terrace
19:00 – 21:00	AEWG banquet and Awards Presentation	Planters Suite

PROGRAM IN DETAIL

Tuesday, June 19 – Morning Program <i>Rutledge/Heyward Room</i>	
7:00 – 8:00	Breakfast & Registration <i>Queen Street Gallery</i>
8:00 – 8:05	Opening Didem Ozevin
8:05 – 8:10	Welcome Paul Ziehl
8:10 – 8:40	Keynote Lee Floyd, recently retired State Bridge Maintenance Engineer, SCDOT, now a Bridge Engineer with WSP USA
8:40 – 10:00	Tech Session I: Infrastructure Chair: Tomoki Shiotani
8:40 – 9:00	Repair Effect of ASR Deteriorated RC Bridge Decks with Acoustic Approaches Tomoki Shiotani, Nobuhiro Okude, Takahiro Nishida, Yasushi Tanaka, Shogo Furuno
9:00 – 9:20	Acoustic Emission Monitoring of Detensioning and Transport of Prefabricated and Prestressed Reinforced Concrete Bridge Girders Dryver Huston, Robert Farrell, Dan Orfeo, Robert L. Worley II, Dylan Burns, Tian Xia, Mandar Dewoolkar
9:20 – 9:40	Signal Processing Based Filters for Acoustic Emission Data in Prestressed Concrete Marwa Abdelrahman, Mohamed ElBatanouny, John Rose, Paul Ziehl
9:40 – 10:00	On-Site Acoustic-Emission Monitoring for Assessment of a Prestressed Concrete BT-54 AASHTO Girder Bridge Rafal Anay, Abram Lane, David V. Jáuregui, Brad D. Weldon, Vafa Soltangharaei, Paul Ziehl
10:00 – 10:30	Morning Break - (Awards Committee Meeting) <i>Queen Street Gallery</i>

Tuesday, June 19 – Morning Program (Continued)

Rutledge/Heyward Room

10:30 – 12:10	Tech Session II: Infrastructure (continued) Chair: Arvin Ebrahimkhanlou
10:30 – 10:50	Fatigue Damage Characterization of RC slabs Considering Water Infiltration by Means of 3D AE Tomography Hisafumi Asaue, Tomoki Shiotani, Shintaro Fukumoto, Yasushi Tanaka, Ichiro Iwaki
10:50 – 11:10	Enhanced Synchrosqueezed Wavelet Transform Based Acoustic Emission Feature Quantification and Signal Classification for Eail Crack Monitoring Dan Li, Kevin Sze Chiang Kuang, Chan Ghee Koh, and Dong Yang
11:10 – 11:30	Improvement of Computation Algorithms of AE Tomography through Damage Evaluation for a RC Girder Joint Riku Murakami, Tomoki Shiotani, Hisafumi Asaue, Katsufumi Hashimoto, Kimble West
11:30 – 11:50	Acoustic Emission Monitoring of a Nuclear Containment Wall during Post-tensioning: Data Mining and Knowledge Discovery Arvin Ebrahimkhanlou, Jongkwon Choi, Trevor D. Hrynyk, Salvatore Salamone, Oguzhan Bayrak
11:50 – 12:10	Blockage Detection in Pipes by Continuous Emission of Acoustic Signal Mohammed Al-Tofan, Mohamed Elkholy, Sahad Khilqa, Lateef Assi, Rafal Anay, M. Hanif Chaudhry
12:10 – 13:10	Lunch - (<i>Executive Committee Meeting</i>) <i>Barbadoes Room</i>

Tuesday, June 19 Afternoon Program*

Rutledge/Heyward Room

13:10 – 14:10	Commercial Presentations Chair: Didem Ozevin
14:10 – 14:30	USC's McNAIR Center for Aerospace Research & Innovation Abdel Bayoumi
14:30 – 15:50	Tech Session III: Aerospace & Composites Chair: Yoshihiro Mizutani
14:30 – 14:50	AE propagation in CFRP with Curved Fibers Yoshihiro Mizutani, Takeshi Ashizawa, Akira Todoroki, Yoshiro Suzuki
14:50 – 15:10	Damage Identification in Composites through Acoustic Emission Monitoring Neha Chandarana, Constantinos Soutis, Matthieu Gresil
15:10 – 15:30	Early-stage Damage Detection using Carbon Nanotube-Embedded Advanced Aerospace Composites Natasha Bradley, Michael Coatney, Asha Hall, Latha Nataraj
15:30 – 15:50	A Review of the Applications of Acoustic Emission Testing in Composite Repair Fady F. Barsoum and Isabel M. McBrayer
15:50 – 16:20	Afternoon Break - (IIIAE Board meeting) <i>Queen Street Gallery</i>

Tuesday, June 19 Afternoon Program (Continued)

Rutledge/Heyward Room

16:20 – 17:20	Tech Session IV: Aerospace & Composites Chair: Natasha Bradley
16:20 – 16:40	Towards Achieving an Autonomous Acoustic Emission Based Structural Health Monitoring Solution for Aircraft John McCrory, Stephen Grigg, Scott Townsend, Renato Picelli, Alicia Kim, Carol Featherston, Karen Holford, Rhys Pullin
16:40 – 17:00	Acoustic Emission Correlation with Damage Mechanics in a Composite Material Michael Coatney, Mulugeta Haile, Asha Hall, Jin Hyeong Yoo, Natasha Bradley
17:00 – 17:20	Zonal Source Location of AE Events on an Airplane Elevator using Neural Network Supervised Method Vafa Soltangharaei, Rafal Anay, Deepak Begrajka, Michael Van Tooren, Paul Ziehl
17:20 – 17:25	Wrap-Up by Paul Ziehl
17:25	Adjourn for the Day
18:00 – 18:45	Informal Walking Tour of Charleston – Meet in Courtyard of The Mills House Hotel
	Dinner on your own

Wednesday, June 20 – Morning Program

Rutledge/Heyward Room

7:00 – 8:00	Breakfast & Registration
8:00 – 8:05	Opening & Announcements Paul Ziehl
8:05 – 8:35	Keynote: Historical Perspectives of Guided-Wave AE and New Developments Kanji Ono, Professor Emeritus, UCLA
8:35 – 10:15	Tech Session V: Sensors/Sensing/Signal Analysis/Modeling Chair: Hartmut Vallen
8:35 – 8:55	Obtaining the Sensitivities of an AE Sensor Based on Motions Verified by a Scanning Laser Vibrometer Hartmut Vallen
8:55 – 9:15	Comparison of Wavenumber Estimate Techniques for Acoustic Wavenumber Spectroscopy Frederick Purcell, Rhys Pullin, Davide Crivelli, Ryan Marks
9:15 – 9:35	Piezoelectric Micromachined Acoustic Emission Sensors Minoo Kabir, Hanie Kazari and Didem Ozevin
9:35 – 9:55	A Deep Learning Approach to Localization of Acoustic Emission Sources in Plate-like Structures with One Sensor Arvin Ebrahimkhanlou, Salvatore Salamone
9:55 – 10:15	Experiments for Analysis of AE Location Arrays Richard Nordstrom, David Kosnik, Horst Trattng
10:15 – 10:45	Morning Break <i>Queen Street Gallery</i>

Wednesday, June 20 - Morning Program (Continued)

Rutledge/Heyward Room

10:45 – 12:05	Tech Session VI: Sensors/Sensing/Signal Analysis/Modeling (Continued) Chair: Rhys Pullin
10:45 – 11:05	A Study of Sludge Volume inside Crude Oil Storage Tanks using AE Technique and Thermography Ireneusz Baran, Tomasz Dunaj, Marek Nowak
11:05 – 11:25	Additive Wave Analysis: A Hit Based Approach to Wavestreaming with Acoustic Emission John McCrory, Matthew Pearson, Karen Holford, Rhys Pullin
11:25 – 11:45	Intergranular Stress Corrosion Crack Detection in 304L Stainless Steel Using Acoustic Emission Joseph Hill, Li Ai, Vafa Soltangharai, Bruce Greer, Paul Ziehl
11:45 – 12:05	Finite Element Modeling of Elastic Wave Generated by Crack Growth Li Ai, Rafal Anay, Vafa Soltangharai, Lateef Assi, Bruce Greer, Paul Ziehl
12:05 – 13:05	Lunch Barbadoes Room

Wednesday, June 20 Afternoon Program*

Rutledge/Heyward Room

13:05 – 14:05	Business Meeting Chair: Didem Ozevin
14:05 – 15:45	Tech Session VII: Fatigue/Fracture Chair: Antonios Kotsos
14:05 – 14:25	Detection and Location of Cracking in Additive Layer Manufacturing Processes using Acoustic Emission Rhys Pullin, Davide Crivelli, John McCrory, Stephen Ball, Damon Northeast, Jonathan Mansell
14:25 – 14:45	Using Artificial Neural Networks in a Methodical Approach to Develop Suitable Classification Systems of Acoustic Emission Data Generated in Tribological Contacts Knut Wantzen, Arn Jöger, Tobias Stürmlinger, Albert Albers
14:45 – 15:05	Methodology to Extract Damage-related Signals Embedded into Streamed Acoustic Emission Signals Lu Zhang, Didem Ozevin, David He, William Hardman, Alan Timmons
15:05 – 15:25	Data-driven Fatigue Prognostics Based on Acoustic Emission Monitoring Brian J. Wisner, Konstantinos Baxevanakis, Sara Schlenker, Harsh Baid, Antonios Kotsos
15:25 – 15:45	Vibration Induced Acoustic Emission Waveforms in a Fatigue Crack Md Yeasin Bhuiyan, Victor Giurgiutiu
15:45 – 16:15	Afternoon Break <i>Queen Street Gallery</i>

Wednesday, June 20 Afternoon Program (Continued)

Rutledge/Heyward Room

16:15 – 17:55	Tech Session VIII: Fatigue/Fracture (Continued) Chair: Didem Ozevin
16:15 – 16:35	Detection of Screw Thread Stripping in Medical Applications using Acoustic Emission Rhys Pullin, John McCroy, Davide Crivelli
16:35 – 16:55	Investigation of Particle Fracture in Aluminum Alloys by Coupling In Situ X-Ray μ-CT with Acoustic Emission Monitoring Brian J. Wisner, Philipp Postada, Markus Sause, Antonios Kontsos
16:55 – 17:15	Fatigue Damage Identification via Post-processing of Microstructure-related Acoustic Emission Data Krzysztof Mazur, Brian J. Wisner, Antonios Kontsos
17:15 – 17:35	Noise Blocking by Metamaterials to Enhance the Crack Detection of AE Method Minoo Kabir, Amir Mostavi, Didem Ozevin
17:35 – 17:55	Deep Learning Based Rolling Bearing Fault Detection with Acoustic and Vibratory signals Guangxing Niu, Edward Mayfield, Bin Zhang
17:55 – 18:00	Closing Remarks by Paul Ziehl
18:00	Adjourn
18:00 – 19:00	Reception <i>Meeting St. Terrace</i>
19:00 – 21:00	Awards Banquet <i>Planters Suite</i>

THANK YOU TO OUR SPONSORS

