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For queries or support, contact Sharon Giordano:
GiordanoS@asme.org
YOUR HOSTS

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Saturday, June 8

Short Courses
- Corrosion and Fouling in Marine Environment
  9:00 – 17:00
  Jura (Crowne Plaza)
- Verification & Validation of Industrial CFD
  09:00 – 17:00
  Staffa/Shuna (Crowne Plaza)
- Welcome Dinner
  19:00 onwards
  Off-site

Sunday, June 9

Outreach
- Welcome & Introductions
  Industry Presentations
  08:00 – 17:00
  Castle 1 (Crowne Plaza)
- Offshore Wind Turbines: Dynamic Analysis and Marine Operations
  09:00 – 17:00
  Jura (Crowne Plaza)
- WEC Dynamics and Control Design
  09:00 – 17:00
  Castle 3 (Crowne Plaza)
- Introduction to Machine Learning and Data-driven Modelling Methods for Engineering Applications
  09:00 – 17:00
  Castle 2 (Crowne Plaza)

Monday, June 10

Opening Ceremony and Keynote Plenaries 08:30 – 10:00
SEC Armadillo

Welcome and Opening Remarks
Prof. Arvind Aneja, Chair, Conference Chair, OMAE 2019
Prof. Michael F. Nilsson, Technical Program Chair, OMAE 2019
Prof. Antonio C. F. Fernandes, OQAE Division Chair
Prof. Dr. Jim Donaldson, Principal, University of Strathclyde
Eva Bolander, Lord Provost of Glasgow

Keynote Plenary One
Blue Oceans: Offshore Research for Future Maritime Challenges
Dr. Bob Buchner, President, MARIN

Awards

Refreshment Break 10:00 – 10:30 Hall 5 (SEC)

Keynote Plenaries (Continued) 10:30 – 12:00 SEC Armadillo

Keynote Plenary Two
Advancing a Lower Carbon Future
David Dickson, Vice President, Safety & Operational Risk, Global Operations, BP

Keynote Panel
Offshore Digital
Moderator: Xiaohui (Christina) Wang, PhD, Vice President, Global Marine, American Bureau of Shipping (ABS)
Panelists: Prof. Kjetil Skauge, PhD, Chief Researcher, University of Bergen and Downstream Technology, Equinor; Dr. Agnieszka Debaere, Digital Transformation Director, HXB Offshore

OMAE 2020 Presentation
Prof. Manish Dhawan, Conference Chair, OMAE 2020
Prof. Ron Young, Conference Co-Chair, OMAE 2020

Opening Lunch 12:00 – 13:30 Hall 5 (SEC)

Concurrent Sessions 13:30 – 15:00
OT 1-1-2 FPSO and Arctic Structures
OT 1-2-2 FPSO and Arctic Structures
OT 1-3-2 Dynamic Positioning
SSR 2-1-1 Collision and Crashworthiness I
SSR 2-1-2 Data-Driven Models
MAT 2-1-1 Formulation of the Fracture Parameter
PRS 4-1-1 Flexible Pipes I
PRS 4-2-1 Collars
OSU 5-1-1 Marine Utilization and Marine Spatial Planning
OE 6-1-2 Floating Body Technology
CE 6-1-1 Marine Control and Automation
CTD 9-1-1 FSI
ORE 9-1-1 Bottom-Water Turbines
OG 10-1-1 Seabed Infrastructure and Processes
PT 11-1-1 Well Drilling Fluids and Hydraulics I
HRT 12-1-1 Numerical and Experimental Methods in Hydrodynamics
CHE 13-1-1 Small vessel and Related Technology

Refreshment Break 15:00 – 15:30 Hall 5 (SEC)

Concurrent Sessions 15:30 – 17:30
OT 1-4-3 Design Optimization
OT 6-1-1 CFD Numerical Waves and Applications
SSR 2-1-1 Probabilistic Response Models
SSR 2-1-2 Collision and Crashworthiness II
MAT 3-2-1 Advances in Materials Characterization
PRS 3-1-1 Flexible Pipes IV
PRS 4-2-2 SCR and Subsea
OSU 5-2-1 Borehole and Energy
OE 6-1-2 Marine Operations and Vessel Movements
OE 6-2-1 Autonomous Vehicle Technology
CFD 8-1-1 Surface Waves
ORE 9-2-1 Aerodynamics I
OG 10-2-1 Anchors
PT 11-7-3 Well Drilling Fluids and Hydraulics III
HRT 12-2-1 Multi-Body Hydrodynamics
OT 12-2-1 Numerical Methods

ASME & MacEh Connect Roundtable 16:00 – 18:00 Forth Room

Afternoon Lecture Series 17:40 – 18:10 Lomond Auditorium
European Research Council – Funding Opportunities (SEC) for Creative Minds from All Over the World
Dr. Luis Azevedo Santos, Scientific Officer, European Research Council

Afternoon Drinks Reception 18:15 – 19:15 Hall 5 (SEC)

Tuesday, June 11

Concurrent Sessions 08:30 – 10:00
OT 1-1-3 Rotating Wind Platforms
OT 1-2-2 Mooring System Design and Analysis I
SSR 2-1-1 Fatigue and Fracture Reliability I
SSR 2-1-2 Extreme Loading and Responses I
SSR 2-1-3 Structural Analysis and Optimization I
MAT 3-1-1 Fracture Toughness measurement and Assessment
PRS 4-1-2 Flexible Pipes II
PRS 4-3-1 Installation
OSU 5-2-1 Offshore Foundations I
OE 6-2-1 Coastal Engineering I
OE 6-4-2 Marine Engineering and Applications II
CFD 8-2-2 Free Surface Modeling
ORE 9-3-1 Wave Energy Converters Control Systems Competition (WECCOMP)
OG 10-1-1 Pile Foundations I
PT 11-9-2 Well Drilling Fluids and Hydraulics II
HRT 12-6-1 Hydrodynamic Aspects of Offshore Renewable Energy
OT 13-2-2 Experiments and Numerical Validation

Refreshment Break 10:00 – 10:30 Hall 5 (SEC)

Concurrent Sessions 10:30 – 12:00
OT 1-2-3 Dynamic Positioning II
SSR 2-2-1 Fatigue and Fracture Reliability II
SSR 2-2-2 Extreme Loading and Responses II
SSR 2-2-3 Structural Analysis and Optimization II
MAT 3-2-1 Steel Performance in Sour Environment
PRS 4-1-3 Flexible Pipes III
PRS 4-3-6 ECA
OSU 5-1-2 Offshore Foundation Design and Installation
OE 6-2-2 Marine Engineering and Applications III
OE 6-4-4 Marine Engineering and Applications II
CFD 8-2-2 Free Surface Loading and Structure Interaction I
ORE 9-4-3 Optimization and Load Analysis
OG 10-5-1 Pile Bases and Steel Foundations
PT 11-6-1 Integrity of Well Risers
HRT 12-5-1 Non-Linear Waves and Wave Effects I
OT 13-2-3 Fluid-Structure Interactions (FSI)

Lunch 12:00 – 13:30 Hall 5 (SEC)

Concurrent Sessions 13:30 – 15:00
OT 1-3-5 Artificial Intelligence and Advance Analysis
OT 1-2-4 Mooring System Design and Analysis II
SSR 2-3-1 Fatigue and Fracture Reliability III
SSR 2-3-2 Extreme Loading and Responses III
SSR 2-3-3 Structural Analysis and Optimization III
MAT 3-2-2 Performance of Mooring Chains
PRS 4-1-5 Flexible Pipes V
PRS 4-2-2 General Design and Analysis
OSU 5-2-1 Offshore Foundations II
OE 6-3-3 Coastal Engineering II
OE 6-3-4 Very Large Floating Structures
CFD 8-3-1 Free Surface Loading and Structure Interaction II
ORE 9-5-2 Concepts and Design
OG 10-6-1 Pipeline Geotechnics
PT 11-8-2 Integrity of Well Risers II
HRT 12-6-2 Non-Linear Waves and Wave Effects II
OT 13-2-4 Fluid-Structure Interactions (FSI)

Refreshment Break 15:00 – 15:30 Hall 5 (SEC)

Concurrent Sessions 15:30 – 17:30
OT 1-4-2 Loads and Responses in Current and Wind II
SSR 2-4-1 Extreme Loading and Responses IV
MAT 3-3-3 Advances in Assesing Performance of Steel
PRS 4-2-2 General Design and Analysis II
PRS 4-5-1 Flow Assurance I
OSU 5-3-1 Development of Deep Sea Mining and Resources
OE 6-4-6 Towed Cables, Ropes and Mooring Systems
OE 6-2-2 Floating Bodies Technology
OE 6-2-1 Ocean Measurement and Data Interpretation
PT 7-1-1 Arctic Pontoons and Mooring in Ice
CFD 8-3-1 Wave CFD modeling Applications
ORE 9-2-3 Rotating Wind Designs
OG 10-7-1 Pile Foundations II
PT 11-7-1 Sentiment
HRT 12-7-1 Large-Amplitude Non-Linear Ship Motions
OT 13-2-5 Others

Afternoon Lecture Series 17:40 – 18:30 Lomond Auditorium
Inspired by Myriad Laughing Waves: (SEC)
Faulkner, Nixons and Stokeys
Prof. Rodney Leask, Taylor, Emeritus Professor, University of Oxford

Afternoon Drinks Reception 18:15 – 19:15 Hall 5 (SEC)
**Wednesday, June 12**

**Concurrent Sessions 0830 - 1000**

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<td>GUS 5-1</td>
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<td>Fatigue and Fatigue-Related Problems II</td>
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<td>HRT 12</td>
<td>Numerical and Experimental Methods in Hydrodynamics II</td>
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<tr>
<td>OT 13-2</td>
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**Lunch 1200 - 1330**

**Concurrent Sessions 1330 - 1500**

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<td>Probabilistic and Spectral Wave Models I</td>
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**Refreshment Break 1500 - 1530**

**Concurrent Sessions 1530 - 1700**

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Afternoon Lecture Series 1700 - 1830: Lomond Auditorium
- Enjoyable Marine Engineering Researches on Sports, (SEC) Environment, not only Wave Engineering, Nonlinear Hydrodynamic Forces and Stabilities

**Thursday, June 13**

**Breakfast Outfit 0730 - 1000**

**Concurrent Sessions 0830 - 1000**

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**Technical Session Organizers’ Lunch 1200 - 1330**

**Concurrent Sessions 1330 - 1500**

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**Refreshment Break 1500 - 1530**

**Concurrent Sessions 1530 - 1700**

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Afternoon Lecture Series 1700 - 1830: Lomond Auditorium
- Enjoyable Marine Engineering Researches on Sports, (SEC) Environment, not only Wave Engineering, Nonlinear Hydrodynamic Forces and Stabilities

**Friday, June 14**

**Breakfast Outfit 0730 - 1000**

**Concurrent Sessions 0830 - 1000**

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**Technical Tours**
- Technical Tour to Advancing Forming Research Centre and Falkirk Wheel
- Technical Tour to Subsea 7 and Falkirk Wheel

**Exhibition**
- Hall 5 (SEC)
- Monday, June 10, 0830 - 1730
- Tuesday, June 11, 0830 - 1730
- Wednesday, June 12, 0830 - 1730
- Thursday, June 13, 0830 - 1530

**Daily Program Handout**

An updated daily program handout will be available at the registration desk the mornings of Tuesday, Wednesday, and Thursday. The handout will incorporate any last-minute program changes and show the time-synchronized order of presentations in each session for that day. You can use this handout as a general reference and to easily plan your personal attendance schedule for the day. The program changes will also be updated on the ASME Crowd Compass App.

**Key to Symposium Abbreviations**

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<tr>
<td>Subsea 7 and Falkirk Wheel</td>
<td>Symposium on Offshore Technology</td>
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- See Detailed Program starting on page xx for concurrent session room locations.
A Monte Carlo Based Simulation Method for Damage Stability Problems  OMAE2019-95295
Stefan Krueger* Hendrik Dankaowski*
1. Hamburg University of Technology, Hamburg, Germany;
2. Fliessbuerger Schaffma Gesellschaft, Fliessburg, Germany

Kushal Soloman, Deepak Kumar
Indian Institute of Technology Madras, Chennai, India

Extended Kalman Filtering for Estimating Drag and Inertia Coefficients for Slender Offshore Structures OMAE2019-96610
Dhruv Bhagatni, Mitesh Saha
Indian Institute of Technology Madras, Chennai, India

Development of YS 300MPa Thick Steel Plate with Weld Joint CTOD Property for Offshore Structures OMAE2019-95465
Yusuke Terazawa* Katsuyuki Ichimura* Kei Ueda* Satoshi Ishiguchi Kaneta* Akio Yashiro* Masahiro Sumi
1. JFE Steel Corporation, Kawasaki, Japan; 2. JFE Steel Corporation, Fukuyama, Japan; 3. JFE Steel Corporation, Tokyo, Japan

Effect of Tensile Pre-strain on Collapse Pressure of Coated Linepipe OMAE2019-95923
Takahiro Sakimoto* Tatsuhito Honda* Hikaku Takai* Yoshiaki Murakami* Joe Konose*
1. JFE Steel Corporation, Chiba, Japan; 2. JFE Steel Corporation, Tokyo, Japan;

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**Structures, Safety and Reliability**

**2-10-2 Collision and Crashworthiness II**

**Monday June 10**
**Room: Crowne Plaza, Castle 1 | 15:30 – 17:30**

**Session Chair:** Zhigang Hu, Newcastle University, United Kingdom

**Session Co-Chair:** Sören Ehlers, Hamburg University of Technology, Germany

**3D Printing Miniature Structural Models for Structural Analysis Purpose: Is it Possible?** OMAE2019-95772
Miguel Angel Calle Gonzalez, Pertiit Kuula
Aalto University, Espoo, Finland

**Enhancement of Structural Redundancy of Hull Structure in Accidental Condition by Applying Highly Ductile Steel**
Shin moto*
1. Mitsubishi Ship Building, Nagasaki, Japan; 2. JFE Steel Corporation, Kawasaki, Japan;
3. JFE Steel Corporation, Tokyo, Japan; 4. Nippon Kokai Kiyaku (ClassNK), Tokyo, Japan

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**Materials Technology**

**3-9-1 Advances in Materials Characterization**

**Monday June 10**
**Room: SEC, Botsdale 1 | 15:30 – 17:30**

**Session Chair:** Sheng Bao, Zhejiang University, China

**Session Co-Chair:** Yanlei Zhang, TWI Ltd, United Kingdom

**Corrosion Behaviour of Cupronickel 90/10 Alloys in Arabian Sea Conditions and its Effect on Maintenance of Marine Structures** OMAE2019-90257
Muntazir Abbas, Mahmoud Shafeeq, Nigel Simms
Galvamark University, Bedford, United Kingdom

**A Comparative Study of Mechanical Properties of Biodegradable PBSAT and PA Gelfets in Norwegian Coastal Waters** OMAE2019-95359
Biao Su, Hadi Moe Fere, Eduardo Girmalde
SINTEF Ocean, Trondheim, Norway

Kyung Tae Tabe* Jung Shimmu* Satoshi Ishiguchi* Roji Murakawa*
1. JFE Steel Corporation, Fukuyama, Japan; 2. JFE Steel Corporation, Kawasaki, Japan

**Improvement on Toughness of Weld Heat Affected Zone of Cu-containing Low Alloy Steel of Long Part Forging for Offshore Applications by Optimizing Chemical Composition** OMAE2019-95816
Yuta Honma1 Gen Sakai1 Kunihiro Hashi1 Fumiyoshi Minami1
1. The Japan Steel Works, Ltd., Murotan, Japan; 2. Osaka University, Ibaraki, Japan

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**Pipelines, Risers, and Subsea Systems**

**4-1-4 Pipes, Risers, and Subsea Systems**

**Monday June 10**
**Room: Crowne Plaza, Staffa / Shuna | 15:30 – 17:30**

**Session Chair:** Anh Tuan Do, TechnipFMC, France

**Session Co-Chair:** Muriel Augusto Vaz, COPPE/UFRJ, Brazil

**Lean Global Analysis of Marine Slender Structures with Machine Learning** OMAE2019-95142
Vinicius Ribeiro Machado da Silva, Mattheus Santos, Mario Vignoles
TechnipFMC, Rio de Janeiro, Brazil

**Non-linearly Restoring Performance and Its Hysteresis Behavior of Dynamic Catenary** OMAE2019-95567
Yilun Li* Shuangguo Guo* Yue Kong* Min Li* Weimin Chen*
1. Beijing University of Aeronautics and Astronautics, Beijing, China;
2. Institute of Mechanics, Chinese Academy of Sciences, Beijing, China

**Flexible Riser Top Connection Analysis with T-Tube Interface and Bending Hysteresis Effect** OMAE2019-95828
Yangfeng He* Hailong Li* Muriel Augusto Vaz* Marcus Coe*
1. Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. COPPE/UFRJ

**Sensitivity Studies on Offshore Submarine Hoses on CALM Buoy with Comparisons for Chinese-Lantern and Lazy-S Configuration** OMAE2019-96755
Chienheh Victor Amadeh* Juanita Ye* Xuanan Hou* Tsyong Wang*
1. Lancaster University, Lancaster, United Kingdom; 2. Hangzhou University, Hangzhou, China

**Investigation on Mechanical Properties of Fiberglass Reinforced Flexible Pipes under Bending**
Yifan Guo1 Shan Jin2 Peng Cheng2 Peilin Han1 Yong Bili1
1. Zhejiang University, Hangzhou, China; 2. Zhejiang University, College of Civil Engineering and Architecture, Hangzhou, China; 3. Zhejiang University, Zhejiang, China

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**4-2-5 SCRs and SLWRS II**

**Monday June 10**
**Room: Crowne Plaza, Castle 3 | 15:30 – 17:30**

**Session Chair:** Olav Fynnyerd, DNV GL, Norway

**Strength and Fatigue Performance of Steel Lazy Wave Risers with Change in Configuration Parameters** OMAE2019-95135
Mayank Lal, Feng Wang, Xiaohua Liu, Abbas Hashi, Sebastian
Genera Oil and Gas Consultants, Houston, TX, United States

**Improved Fatigue Design of SCR-modified Miner’s Rule** OMAE2019-95344
Hans Olav Kragenheim* Mons Havre* Bjorn Nyhus*
1. Equinor ASA, Fana, Norway; 2. Equinor ASA, Rennesle, Norway; 3. SINTEF, Trondheim, Norway
## Abstract

With more developments into cost-effective offshore designs, the application of offshore hoses has been adapted for water depths that are not too deep, and for short-service life platforms. This has led to the advances on offloading and loading operations in the offshore industry based on the utilization of Catenary Anchor Leg Moorings (CALM) buoys. However, variations in the soil stiffness and environmental conditions necessitate the investigation on the behaviour of the submarine hoses based on the structural and hydrodynamic behaviour. The sensitivity study will help hose manufacturers in the problem of submarine hose failures due to high curvatures. In this study, dynamic analysis is carried out based on the design of the submarine hoses attached to a CALM buoy for both cases of the Chinese-lantern configuration and Lazy-S configurations. Six mooring lines are attached to the CALM buoy with a water depth of 26 m and 100 m, respectively. Hydrodynamic simulation using ANSYS AQWA is first conducted and later coupled into the dynamic models in Orcaflex. Sensitivity studies were conducted to study the effect of wave height, flow angles, soil stiffness and hose hydrodynamic loads on the structural behaviour of the submarine hoses.

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### Status

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<tr>
<td>Abstract submitted</td>
<td>22 Dec 2018</td>
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<tr>
<td>Abstract accepted</td>
<td>22 Dec 2018</td>
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<td>Paper reinstated</td>
<td>19 Feb 2019</td>
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### Authors

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<th>Name</th>
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<tbody>
<tr>
<td>Mr. Chiemela Victor Amaechi</td>
<td>Lancaster University</td>
<td>1</td>
<td>Contact Presentation and Lead Author</td>
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<tr>
<td>Prof. Jiahao Ye</td>
<td>Lancaster University</td>
<td>2</td>
<td>Co-Author</td>
</tr>
<tr>
<td>Dr. Xiaoan Hou</td>
<td>Tsinghua University</td>
<td>3</td>
<td>Co-Author</td>
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<td>Dr. Fa-Cheng Wang</td>
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<td>Co-Author</td>
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**Sensitivity studies on offshore submarine hoses on CALM buoy with comparisons for Chinese-lantern and Lazy-S configuration**
February 20, 2019

Lancaster University
Engineering Department, Bailrigg
Lancaster, Lancashire, UK
LA1 4YW

Dear Chiemela Victor Amaechi,

It is my understanding that you plan to participate in and present a paper at the 38th International Conference on Ocean, Offshore & Arctic Engineering, which is being held from June 9 – 14, 2019 in Glasgow, Scotland. This conference is being financially sponsored by ASME.

You will be presenting the paper OMAE2019-96755 entitled "Sensitivity studies on offshore submarine hoses on CALM buoy with comparisons for Chinese-lantern and Lazy-S configuration."

ASME is the premier organization for the promotion of the art, science, and practice of mechanical engineering throughout the world. Our mission is to promote and enhance the technical competency and professional well-being of our members, and through quality programs and activities in mechanical engineering better enable its practitioners to contribute to the well-being of humankind.

You are expected to undertake all expenses.

Sincerely,

Jeff Patterson
Chief Operating Officer

Phyllis Klasky
Director, Events Management
SENSITIVITY STUDIES ON OFFSHORE SUBMARINE HOSES ON CALM BUOY WITH COMPARISONS FOR CHINESE-LANTERN AND LAZY-S CONFIGURATION

ASME OMAE 2019 38th International Conference on Ocean, Offshore and Arctic Engineering,
OMAE2019-96755
June 9-14, 2019, Glasgow, Scotland

Amaechi Chiemela Victor¹,³, Xiaonan Hou¹, Fa-Cheng Wang², Jianqiao Ye¹,

Presentation Date: Mon, 10th June, 2019
Venue: SEC Centre & Crown Hotel, Glasgow, UK
Affiliation: ¹Engineering Department, Lancaster University, UK
²Tsinghua University, Civil Engineering Department, Beijing 100084, PR China
³Standards Organisation of Nigeria (SON), 52 Lome Crescent, Wuse Zone 7, Abuja, Nigeria

Research Sponsors:
1. NDDC (Niger Delta Development Commission), Nigeria.
2. Engineering Department, Lancaster University, Lancaster, UK.

camaechi@lancaster.ac.uk, ye2@lancaster.ac.uk