HOLM 2017: Advance Program (subject to changes)

(Dated July 20, 2017)

Monday, Sept 11

08:00  Holm Award: Siegfried Fouvry
  Chair: Rob Martens
  Co-Chair: Sophie Noël

Fretting Wear of Low Current Electrical Contacts: Quantification of Electrical Endurance
Siegfried Fouvry
École Centrale de Lyon

09:25  Session 1 - Young Investigator Presentations
  Chair: Timo Muetzel
  Co-Chair: Peter Hale

  1.1 Study of the Electric Arc in DC Contactors: Modeling, Simulation and Experimental Validation
  Marc Buffo¹, Jean-Philippe Martin¹, Shahrokh Saadato¹, Jonathan Andrea², Nicolas Dumoulin¹, Eric Guillard³
  ¹University of Lorraine Laboratoire GREEN, ²Esterline Power Systems Research and Innovation Department, ³Esterline Power Systems Research and Innovation Department

  1.2 Effect of Fretting Wear of Connectors Regarding Phase Noise of RF Signal: Influence of Sliding Amplitude and Gold Coating Thickness
  Richard Enquebecq¹, Olivier Graton², Siegfried Fouvry², Enrico Rubiola³, Julien Legrand¹, Laurent Petiti³
  ¹Radiall, ²Ecole centrale de Lyon, ³Femto ST

  1.3 Multi-physics Modeling and Au-Ni/Rh Coating Assessment for ITER Ion Cyclotron Resonance Heating Radio-Frequency Sliding Contacts
  Zhaoxi CHEN¹, Julien HILLAIRET³, Viviane TURQ², Yuntao SONG³, Raphaël LALOO², Karl VULLIEZ², Jean-Michel BERNARD³, Qingxi YANG¹, Gilles LOMBARD², Caroline HERNANDEZ¹, Leonel FERREIRA¹, Florent FESQUET¹, Patrick MOLLARD¹, Robert VOLPE¹, Fabien FERLAY²
  ¹CEA, ²Université Paul-Sabatier, ³ASIPP, ⁴CERN

  1.4 Study on Molten Bridge Behaviors with Arc-less Current Commutation in a Hybrid DC Circuit Breaker
  Mo Chen, Yuta Yamada, Shungo Zen, Koichi Yasuoka
  Tokyo Institute of Technology

Session 1 - 1.5 The Impact of Short Circuits on Contact Elements in High Power Applications
  Toni Israel¹, Michael Gatzsche³, Stephan Schlegel³, Steffen Großmann³, Tom Kafner⁴, George Freudiger⁴
  ¹TU Dresden, ²Technische Universität Dresden, ³³, ⁴Stäubli Electrical Connectors AG

11:20  Session 2 - Modeling I
  Chair: Rob Jackson
  Co-Chair: Karumbu Meyyappan

  2.1 Comparison of Spherical and Axisymmetric Models of Electrical Contact Heating and the Conditions of their Application
  Stanislav Kharin
  Professor

  2.2 Research on the Distribution Thermal FEM Model for an Enclosed Isolated Phase Bus-bar in Short-circuit Condition
  Huimin Liang¹, Ruiqiao Wang¹, Jiaxin You¹, Longxing Bao², Hongjian Wang²
  ¹Harbin Institute of Technology, ²Shandong Alfa Dachi Electric Co., Ltd

  2.3 The Impact on Current Density and Constriction Resistance from Bridge Structures in Real Contacts
  Robert Malucci
  RD Malucci

12:20  Lunch
01:40  Session 3 - Arcing Contacts I
Chair: Paul Slade
Co-Chair: Volker Behrens

Session 3 - 3.1 Preliminary Study on Switching Characteristics of Silver Tin Oxide Type Contacts for Capacitive Load
Wanbin Ren1, Jianmin Wei1, Xu Zhang1, Fubiao Luo2, Zhefeng Zhou2, Yinghua Fu3
1Harbin Inst. of Tech., 2G&A Electronics Ltd. Co., 3Chixi Technology Co., China

Session 3 - 3.2 Applications of Laser Arc Image System on Imaging the Arcing Behavior of Electrical Contacts
Hai Chen
Siemens Industry, Inc. Atlanta Georgia

Session 3 - 3.3 Study of the Influence of Permanent Magnets in the Interruption Process of the Electrical Arc in MCB
Eugenio Galvan and Juan Jose Rodriguez
Siemens

Session 3 - 3.4 Measuring Arc Temperature Distribution and its Time-evolution based on Relative Intensity Method
Xue Zhou, Yong Zhang, Guofu Zhai
Harbin Institute of Technology

03:15 -  04:30  Session 4 - Fretting
Chair: Bretton Rickett
Co-Chair: George Drew

Session 4 - 4.1 High Frequency Signal Transmission across Contact Interface Subjected to Vibration Induced Fretting Corrosion
Haoyue Yang1, Thomas Stegeman2, Rui Ji2, Michael Hamilton4, Jinchun Gao5, George Flowers6
1Auburn University, 2Florida State University Panama City, 3School of Electronic Engineering, Beijing University of Posts and Telecommunications, 4Department of Electrical and Computer Engineering Auburn University, 5Beijing University of Posts and Telecommunications, 6

Session 4 - 4.2 Fretting Possibility in Slip Rings: A Review
Glenn Dorsey
Moog, Inc.

Session 4 - 4.3 Reliability Test Induced Failures vs Field Performance: Contact Fretting Perspective
Karumbu Meyyappan, QiFeng Wu, Milena Vujosevic, Charles Hill, Ryan Parrott
Intel Corporation

Session 4 - 4.4 Fretting Behaviour of Tinned Connectors under Grease Lubrication
Sophie Noel1, Aurore Brezard-Oudot2, Pascal Chretien2, David Alamarguy2
1CentraleSupelec-CNRS, 2CentraleSupelec

Session 4 - 4.5 Third Bodies in Electrical Contacts – Wear and Electrical Performance
Jian Song, Vitali Schinow, Haomiao Yuan
Ostwestfalen-Lippe University

Tuesday, Sept 12

08:00  Session 5 - Materials I
Chair: George Drew
Co-Chair: Sophie Noël

Session 5 - 5.1 An Exploratory Study of Silver Nanoparticle Laden Lubricants for Electrical Contacts
Robert Jackson, Alex Coker, Zoe Tucker, Mohammad Hossain, German Mills
Auburn University

Session 5 - 5.2 New LITESURF Plating for the Mitigation of Whisker Risks in Press-Fit Applications
Erika R. Crandall, Frank Schabert, Helge Schmidt, Martin Bleicher, Thomas Fili, Walter E. Mueller - von Fischer, Claus Borhauer, Stefan Thoss, Jorge Villarreal, Bart Kerckhof
TE Connectivity
Session 5 - 5.3  The Effect of the Nickel Underplate on the Heat Resisting Properties of Silver Plated Copper Alloy Contacts
Kenji Kubota¹, Kiyotaka Nakaya¹, Takashi Tamagawa¹, Hiroyuki Mori¹, Toru Nishimura¹, Takashi Isobe¹, Yoshitaka Ito², Tomohiro Shimada², Takaya Kondo²
¹Mitsubishi Materials Corporation, ²Yazaki Parts Co., LTD

Session 5 - 5.4  Thermo-mechanical Stresses within Switching Contact Systems after Arcing Events
Timo Muetzel¹, Duancheng Ma², Franz Roters³, Dierk Raabe³
¹Umicore AG & Co. KG, ²AIT Austrian Institute of Technology, ³Max-Planck-Institut für Eisenforschung GmbH

09:35  Antler Lecture: Randy Sumner
Chair: Jerry Witter

Electrical Vehicles and Autonomous Driving
Randy Sumner
Delphi

10:50  Session 6 - Testing
Chair: Henry Czajkowski
Co-Chair: Ron Coutu

Session 6 - 6.1  Investigation on RF Connector Degradation using Time Domain Reflectometry
Qingya Li¹, Rui Ji¹, Jinchun Gao¹, George Flowers², Gang Xie¹, Weibin Ye³
¹Beijing University of Posts and Telecommunications, ², ³Keysight Technologies (China) Co., Ltd

Session 6 - 6.2  Research on Delamination Detection Sensitivity of Ultrasonic Non-Destructive Testing Technology for Electrical Contact
Lianhui Ye¹, Jiazhong Wang², Benlu Li², Nan Liu², Kai Qiu¹
¹Shanghai Hiwave Precision Instrument Co., Ltd, ²Schneider Shanghai Apparatus Parts Manufacturing Co., Ltd

Session 6 - 6.3  The Failure Mechanism of Electromagnetic Relay in Accelerated Storage Degradation Testing
Zhaoxin WANG¹, Zhoulin HUANG¹, Jiawei WANG¹, Shang SHANG¹, Guofu ZHAI²
¹School of Electronics and Information, Jiangsu University of Science and Technology, ²School of Electrical Engineering and Automation, Harbin Institute of Technology

Session 6 - 6.4  Failure Dependent Progression of Contact Resistance in Thermal-Shock Testing of Spring-Clip Contacts
Matthias Friedlein, Michael Spahr, Robert Sueß-Wolf, Joerg Franke
Institute for Factory Automation and Production Systems

12:10  Awards Lunch

01:30  Session 7 - Sliding Contacts I
Chair: Koichiro Sawa
Co-Chair: Ed Smith

Session 7 - 7.1  Commutation Characteristics and Brush Wear of DC Motor at High Rotation Speed
KOICHIRO SAWA¹, Masayuki Isato², Takahiro Ueno², Keisuke Nakano³, Kenji Kondo³
¹, ²Nippon Institute of Technology, ³Panasonic Corporation

Session 7 - 7.2  Effects of Lubricant Oil on Sliding Contact Phenomena in Carbon Brush-slip Ring System
Yuki Amada¹, KOICHIRO SAWA², Takahiro Ueno¹
¹NIPPON INSTITUTE OF TECHNOLOGY, ²

Session 7 - 7.3  Temperature Characteristics of Sliding Friction Pair under High-speed and Strong-current Conditions
Zhiyong Wang¹, Fengyi Guo¹, Shuai Liu¹, Bilguun Baatar¹, Yuting Wang¹, Haihong Liang²
¹Liaoning Technical University, ²State Grid Liaoning Electric Power Supply Co. Ltd.

Session 7 - 7.4  Off Line Arc Current Detection and Active Control of Pantograph-Catenary System
Ren Zhiling¹, Lin Dong¹, Zhang guangquan¹, Nie ZiQi²
¹Liaoning Technical University, ²Beihang University

03:05  Session 8 - Arching II
Chair: Jerry Witter
Co-Chair: Z.K. Chen
Session 8 - 8.1 Influences of External Magnetic Field Application and Increased Contact Opening Speeds on Break Arc duration Characteristics of AgSnO2 Contacts in DC Inductive Load Conditions
Makoto Hasegawa and Seika Tokumitsu
Chitose Institute of Science and Technology

Session 8 - 8.2 Power Flux Brought by an Electric Arc on AgSnO2 Electrodes
Romaric LANDFRIED1, Frédéric Houzé2, T. Leblanc2, Philippe Testé2
1CentraleSupélec, 2CNRS

Session 8 - 8.3 Influence of Contact Materials and Opening Velocity on Various Characteristics of DC High Voltage Arc
Kiyoshi Yoshida1, Koichiro Sawa2, Kenji Suzuki3, Koetsu Takaya3
1Nippon Institute of Technology, 2Professor Emeritus of Keio University, 3Fuji Electric FA Components & Systems Co., Ltd.

Session 8 - 8.4 Application of a New Ag/AgO2 Contact Material in AC-Contactors
Havva Cinaroglu, Volker Behrens, Thomas Honig
DODUCO GmbH

Wednesday, Sept 13

08:00 Session 9 - Materials II
Chair: Roland Timsit
Co-Chair: Hélène Gauthier

Session 9 - 9.1 Investigation on the Electrical Properties of AgNi Contact Materials with Various Ni Content
Heng Wang1 and Huan Yuan2
1Fuda Alloy Materials Co., Ltd, Wen’zhou 325025, China, 2Fuda Alloy Materials Co., Ltd, Wen’zhou, China

Session 9 - 9.2 In-situ Synthesized Silver-Graphene Nanocomposite with Enhanced Electrical and Mechanical Properties
Pengpeng Wang1, Zhijun Wei1, Minsua Shen1, Hui Pan2, Jun Fu3, Lesheng Chen1
1Shanghai Hiwave Composite Materials Co., Ltd, 2Shanghai Jiao Tong University, 3Schneider Electric (China) Co., Ltd

Session 9 - 9.3 The Influence of Multiscale Surface Roughness on Contact Mechanics using Finite Element Modeling: Applied to a Au-coated CNT Composite Electrical Contact Surface
Hong Liu1 and John McBride2
1University of Southampton Malaysia Campus, 2University of Southampton; University of Southampton Malaysia Campus

09:15 Session 10 - Switching / Vacuum Interrupters
Chair: Timo Mutzel
Co-Chair: Xin Zhou

Session 10 - 10.1 Influence of Sealed Gas and its Pressure on Arc Discharge in Electromagnetic Contactor
Kiyoshi Yoshida1, Koichiro Sawa2, Kenji Suzuki3, Koetsu Takaya3
1Nippon Institute of Technology, 2Professor Emeritus of Keio University, 3Fuji Electric FA Components & Systems Co., Ltd.

Session 10 - 10.2 Investigation of Arc Splitters in an SF6 Insulated Medium Voltage Switchgear
Balazs Novak1, Rahul Sonar2, Ramesh Sivaraj2
1Lucy Electric, 2Lucy Electric India

Session 10 - 10.3 Development of an Arcless DC Circuit Break using a Mechanical Contact and a Semiconductor Device
Shungo Zen, Tsuyosato Hayakawa, Kyotaro Nakayama, Koichi Yasuoka
Tokyo Institute of Technology

Session 10 - 10.4 Effect of the Axial Magnetic Field Structure on the Threshold Welding Current for Closed Axial Magnetic Field Vacuum Interrupter Contacts
PAUL SLADE1, Erik D. Taylor2, Andreas Lawall2
1, 2Siemens AG

Session 10 - 10.5 Interdependency of Test Environment and Current Breaking Capacity of a Model Vacuum Switch
Alexander Feilbach1, Henrik Menne2, Volker Hinrichsen2, Ulla Hauf3, Martin Heilmayer3, Mike Böning4, Frank Müller4
1High Voltage Laboratories, TU Darmstadt, 2Technische Universität Darmstadt, High Voltage Laboratories, Darmstadt, Germany, 3Karlsruhe Institute of Technology, Institute for Applied Materials, Karlsruhe, Germany, 4Plansee Powertech AG, Seon, Switzerland
11:10 Session 11 - Connectors
   Chair: David Williams
   Co-Chair: Marjorie Myers

Session 11 - 11.1 Glowing Connections in DC Circuits
John Shea
Schneider-Electric

Session 11 - 11.2 Press- and Shrink-fit Connections with Cylindrical Aluminum Conductors for High-current Applications – Contact and Long-term Behavior Depending on Mechanical Parameters
Alexander Ramonat\textsuperscript{1}, Stephan Schlegel\textsuperscript{1}, Steffen Großmann\textsuperscript{1}, Matthias Kudoke\textsuperscript{2}
\textsuperscript{1}TU Dresden, \textsuperscript{2}ABB Switzerland AG

Session 11 - 11.3 Temperature Rise of Canted Spring Contacts during Fault Current
Balazs Novak\textsuperscript{1} and Laszlo Szabo\textsuperscript{2}
\textsuperscript{1}Lucy Electric, \textsuperscript{2}Hyundai Technologies Center Hungary

12:10 Lunch

01:20 Session 12 - Modeling II
   Chair: Bob Malucci
   Co-Chair: Daniel Gagnon

Session 12 - 12.1 Experimental Verification/Comparison between Standard Sphere against Flat and a New Wave-Structured Contact Surface Topography Developed using a Numerical Contact Model: As Applied to an Existing MQS Contact Design
Michael Dr. Leidner\textsuperscript{1}, Matthias Brunner\textsuperscript{1}, Svenja Stotz\textsuperscript{1}, Marjorie Myers\textsuperscript{2}, Helge Dr. Schmidt\textsuperscript{1}, Stefan Thoss\textsuperscript{1}
\textsuperscript{1}TE Connectivity Germany GmbH, \textsuperscript{2}TE Connectivity, Automotive

Session 12 - 12.2 The Role of the Arc Flux and Joule Heating in the Erosion of Electrical Contacts
Stanislav Kharin\textsuperscript{1} and Merey Sarsengeldin\textsuperscript{2}
\textsuperscript{1}Professor, \textsuperscript{2}Assistant professor

Session 12 - 12.3 The Effect of the Distribution of a-spots in the Pperipheral Part of an Apparent Contact Point on Constriction Resistance
Yasuhiro Fukuyama\textsuperscript{1}, Norihiko Sakamoto\textsuperscript{1}, Nobu-Hisa Kaneko\textsuperscript{1}, Takaya Kondo\textsuperscript{2}, Jun Toyoizumi\textsuperscript{2}, Takahiro Yudate\textsuperscript{2}
\textsuperscript{1}National Institute of Advanced Industrial Science and Technology, \textsuperscript{2}Yazaki Parts CO., LTD

02:35 Session 13 - Safety FCI
   Chair: Xin Zhou
   Co-Chair: Guang Yang

Session 13 - 13.1 Feature Analysis in Time-domain and Fault Diagnosis of Series Arc Fault
Yanli Liu, Fengyi Guo, Zhiling Ren, Peilong Wang, Tuan Nghia Nguyen, Jia Zheng, Xirui Zhang
Liaoning Technical University

Session 13 - 13.2 A Series Arc Fault Location Algorithm based on the Impedance Method for a Domestic AC System
Edwin Calderon\textsuperscript{1}, Patrick SCHWEITZER\textsuperscript{2}, Serge Weber\textsuperscript{3}
\textsuperscript{1}University of Lorraine, Jean Lamour Institute, MAE406, Nancy, 54000,\textsuperscript{2}, \textsuperscript{3}University of Lorraine

Session 13 - 13.3 Arcing Fault in Aircraft Distribution Network
Jonathan Andrea\textsuperscript{1}, Marc Buffo\textsuperscript{1}, Eric Guillard\textsuperscript{2}, Romaric Landfried\textsuperscript{2}, Redouane Boukadoum\textsuperscript{2}, Philippe Testé\textsuperscript{4}
\textsuperscript{1}Esterline Power Systems Research and Innovation Department, \textsuperscript{2}University of Lorraine Laboratoire GREEN, \textsuperscript{3}Esterline Power Systems Research and Innovation Departement, \textsuperscript{4}Laboratoire Génie électrique et électronique de Paris, \textsuperscript{5}CentraleSupélec

Session 13 - 13.4 Research on Feature of Series Arc Fault Based on Improved SVD
Hongxin Gao, Xi Li, Tuan Nghia Nguyen, Fengyi Guo, Zhiyong Wang, Jianglong You, Yong Deng
Liaoning Technical University

03:55 Closing Remarks
   Chair: Rod Martins

04:15 Steering Committee Meeting