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ORAL SESSIONS

Switching Phenomena in Low-voltage Circuit Breakers and Relays

Oct. 26 (Mon.)

Chair: Lijun Wang (Xi'an Jiaotong University, China) **Studio G**

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Huazhong University of Science and Technology, China

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[1]Xi'an Jiaotong University, China, [2]Changshu Switchgear Mfg.Co.,Ltd., China

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[1]Xi'an Jiaotong University, China, [2]Changshu Switchgear Mfg.Co.,Ltd., China

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[1]Xi'an Jiaotong University, China, [2]Changshu Switchgear Mfg.Co.,Ltd., China

Fundamental Physics and Electrical Insulation in Switchgears 1

Oct. 26 (Mon.)

Chair: Xin Lin (Shenyang University of Technology, China) **Studio 3**

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Xi'an Jiaotong University, China

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Richard Reeves, Leslie T Falkingham
Vacuum Interrupters Ltd., UK

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Zhexin Chen, Chunping Niu, Hantian Zhang, Hao Sun, Yi Wu, Fei Yang, Mingzhe Rong, Zhenghong Xu
Xi'an Jiaotong University, China

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Hao Sun[1], Yasunori Tanaka[2], Yi Wu[1], Mingzhe Rong[1], Yoshihiko Uesugi[2], Tatsuo Ishijima[2]
[1]Xi'an Jiaotong University, China, [2]Kanazawa University, Japan

14:40-15:00 GO-627 **Experimental Investigation on UHF Partial Discharge Sensor in GIS**
Tianhui Li[1], Mingzhe Rong[2], Xiaohua Wang[2]
[1]Hebei Electric Power Research Institute, China, [2]Xi'an Jiaotong University, China

Simulation Technologies in Switchgears

Oct. 26 (Mon.)

Chair: Jong-Chul Lee (Gangneung-Wonju National University, Korea) **Studio 2**

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Jun-Yeon Jo, Hong-Ik Yang, Kil-Young Ahn, Yong-Ik Park, Young-Geun Kim
LSIS Co., Ltd., Korea

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Mahir Muratovic[1], Amer Smajkic[1], Kyong-Hoe Kim[2], Myoung-Hoo Kim[2], Mirsad Kapetanović[1], Almir Ahmethodzic[1]
[1]University of Sarajevo, Bosnia and Herzegovina, [2]ILJIN Electric Co., Ltd, Korea

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Kyu-Jung Kim, Min-Jee Kim, Young-Kook Kim, Woo-Jin Park, Kil-Young Ahn, Young-Geun Kim
LSIS Co., Ltd., Korea

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Jong-Chul Lee[1], Won-Ho Lee[1], Youn-Jea Kim[2]
[1]Gangneung-Wonju National University, Korea, [2]Sungkyunkwan University, Korea

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Pengfei Zhang[1], Wei Li[1], Kun Yang[1], Ying Feng[1], Peng Cheng[1], Chengyu Wang[1], Huamao Zhan[2]
[1]China Electric Power Research Institute, China, [2]North China Electric Power University, China

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Sead Delić[1,2], Dejan Bešlija[1,2], Dalibor Gorenc[3], Armin Hajdarović[2], Mirsad Kapetanović[1,2]
[1]University of Sarajevo, Bosnia and Herzegovina, [2]EnergoBos ILJIN d.o.o. Sarajevo, Bosnia and Herzegovina, [3]KONČAR-EVA d.d., Republic of Croatia

15:20-15:40 IO-132 **Coupled Simulation of Eddy-Current Thermal Field in Medium Voltage Switchgear**
Hong Lü[1], Wensong Zheng[2], Lijun Wang[2], Liuhuo Wang[1], Jing Lin[2]
[1]Electric Power Research Institute of Guangdong Power Grid Corporation, China, [2]Xi'an Jiaotong University, China

Vacuum Interrupter Technologies 1

Oct. 27 (Tue.)

Chair: Leslie Falkingham (Vacuum Interrupters Limited, UK) **Studio G**

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Byoung-Chul Kim, Sung-Tae Kim, Kil-Young Ahn, Young-Geun Kim
LSIS Co., Ltd., Korea

09:20-09:40 DO-120 **Properties of Intermediate-frequency Vacuum Arc Influenced by Electrode Diameter and Material in Axial Magnetic Field**
Jiang Yuan, Wu Jianwen, Tang Wei
Beihang University, China

09:40-10:00 DO-591 **Development of Cu-Cr-Mo Contact Material for Vacuum Interrupters**
Kosuke Hasegawa, Shota Hayashi, Keita Ishikawa, Kenta Yamamura, Hideki Komatsu, Takaaki Furuhata
Meidensha Corporation, Japan

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He Yang[1], Li Yu[1], Wenjie Hou[1], Somasundara Rao Matu[1], Yingyao Zhang[2]
[1]Eaton Corporation, China, [2]Tongji University, China

Switching Phenomena in High-voltage Systems

Oct. 27 (Tue.)

Chair: Woo-Jin Park (LSIS Co., Ltd., Korea) **Studio G**

10:40-11:00 AO-320 **Speckle Imaging of Switching Arcs in a Supersonic Gas Flow**
J. Carstensen, P. Stoller, E. Panousis, V. Teppati
ABB Switzerland Ltd, Switzerland

11:00-11:20 AO-764 **Exploration Research on Metal-enclosed Switchgear Design of Withstanding Internal Arcing Faults**
Fu-cheng Lang
Electric Power Research Institute of State Grid Liaoning Electric Power Co., Ltd., China

11:20-11:40 AO-208 **Analysis and Experimental Study for Current Break Systems in a Load Break Switch of RMU**
Woo-Jin Park, Ryun-Lyu, Kwang-Su Lyu, Kil-Young Ahn, Young-Geun Kim
LSIS Co., Ltd., Korea

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M. Palazzo, P. Fraioli, A. Marmolejo
ABB Switzerland Ltd., Switzerland

Vacuum Interrupter Technologies 2

Oct. 27 (Tue.)

Chair: Zhiyuan Liu (Xi'an Jiaotong University, China) **Studio G**

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S. Tokoyoda, M. Sato, K. Kamei, D. Yoshida, M. Miyashita, K. Kikuchi, H. Ito
Mitsubishi Electric Corporation, Japan

13:40-14:00 DO-589 **Modeling and Simulation of High-current Vacuum Arc Subjected to Transverse Magnetic Field**
Jie Deng, Lijun Wang, Xiaolong Huang, Shenli Jia
Xi'an Jiaotong University, China

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Rama S Parashar
SuperGrid Institute, France

14:20-14:40 DO-277 **Research of Micro-particle Impact Phenomena on Contact Surface in Vacuum Interrupters**
Yingyao Zhang[1,2], Lijun Jin[1,2], He Yang[3]
[1]Tongji University, China, [2]Xi'an Jiaotong University, China, [3]Eaton Investment Corporation, China

14:40-15:00 DO-427 **Investigation on Small DC Vacuum Arc Characteristic under Transverse Magnetic Field**
Shun Hanashiro, Yuji Nikadori, Eiji Kaneko
University of the Ryukyus, Japan

Fundamental Physics and Electrical Insulation in Switchgears 2

Oct. 27 (Tue.)

Chair: Osamu Yamamoto (Research Institute for Applied Sciences, Japan) **Studio 3**

09:00-09:20 GO-234 **The Influence of Electrode Erosion on Fault Arc**
Mei Li, Mingzhe Rong, Yi Wu, Junpeng Zhang, Yifei Wu
Xi'an Jiaotong University, China

09:20-09:40 GO-459 **The LTE Simulation on Decaying Arc Plasmas in Various Arc Quenching Gases in a Model Circuit Breaker**
Kosuke Murai[1], Tomoyuki Nakano[1], Yasunori Tanaka[1], Yoshihiko Uesugi[1], Tatsuo Ishijima[1], Tatsuro Shiraishi[2], Takahiro Shimizu[2], Kentaro Tomita[2], Katsumi Suzuki[3], Takayasu Fujino[4]
[1]Kanazawa University, Japan, [2]Kyusyu University, Japan, [3]Tokyo Denki University, Japan, [4]University of Tsukuba, Japan

09:40-10:00 GO-218 **Deformation of Contact Surfaces in a Vacuum Interrupter after High-current Interruptions**
Haoran Wang, Zhenxing Wang, Yingsan Geng, Zhiyuan Liu, Jianhua Wang
Xi'an Jiaotong University, China

10:00-10:20 GO-574 **Evaluation of a Factor for Calculating SEEA Charge on Insulator Surface in Vacuum**
Hiroki Naruse[1], Osamu Yamamoto[2]
[1]Kyoto University, Japan, [2]Research Institute of Applied Sciences, Japan

10:20-10:40 GO-740 **The Experimental Research of Secondary Arc in 1000kV UHV Systems in China**
Yanmiao He[1], Wei LI[1], Kun Yang[1], Boyuan Cui[1], Pengfei Zhang[1], Rongjiang Cao[1], Jiming Lin[1], Yichao Yuan[2]
[1]China Electric Power Research Institute, China, [2]North China Electric Power Research Institute Co.Ltd., China

Semi-conductor Switching Technologies + Emerging High Voltage Switching Technologies

Oct. 27 (Tue.)

Chair: Jaeseop Ryu (LSIS Co., Ltd., Korea) **Studio 3**

10:40-11:00 HO-804 **Research on the Control Method of Salient Pole Rotor Brushless Motor Operating Mechanism of High Voltage Circuit Breaker**
Liu Aimin, Lou Jiachuan, Zhang Jinhua, Bi Yujie
Shenyang University of Technology, China

11:00-11:20 EO-713 **Progress on Diamond PIN Diode Emitters with Negative Electron Affinity for High-Voltage d.c. Vacuum Switches**
D. Takeuchi[1,3], H. Kawashima[1,3], D. Kuwabara[1,3], T. Makino[1,3], H. Kato[1,3], M. Ogura[1,3], H. Ohashi[1,3], H. Okushi[1,3], S. Yamasaki[1,3], S. Koizumi[2,3]
[1]ETRI-AIST, Japan, [2]WBM-NIMS, Japan, [3]CREST/JST, Japan

11:20-11:40 HO-747 **Design and Analysis of Salient Pole Rotor Coil Excitation Brushless DC Motor using in High Voltage Circuit Breaker Operating Mechanism**
Liu Aimin, Zhang Jinhua, Lou Jiachuan, Bi Yujie
Shenyang University of Technology, China

Testing Technologies in Switchgears + Others

Oct. 27 (Tue.)

Chair: Sang Hun Park (Korea Electrotechnology Research Institute, Korea) **Studio 3**

13:20-13:40 JO-543 **Recent Standardization Developments and Test-experiences in Switching Inductive Load Current**
R.P.P. Smeets, L.H. te Paske
DNV GL KEMA Laboratories, The Netherlands

13:40-14:00 JO-638 **Consideration of Uncertainty for Current Measurement and Development of Test Data Generator for TRV Measurment**
Hisatoshi Ikeda[1], Koji Ibuki[1], Eiichi Haginomori[1], Tadashi Koshizuka[2], Katsuhiko Harada[3], Tetsuya Nakamoto[4]
[1]The University of Tokyo, Japan, [2]Tokyo Denki University, Japan, [3]Kyushu Institute of Technology, Japan, [4]Toshiba Corp., Japan

14:00-14:20 KO-229 **European Patent Office (EPO): Facts, Figures and Services for Researchers and Inventors**
José-Miguel Nieto, Francisco Javier Rubio Sierra, Jacek Drabko, Jan Fribert, Günther Socher
European Patent Office, Germany

14:20-14:40 KO-820 **Development of Arc Eliminator for 7.2 / 12 kV Switchgear**
Kwang-hyeon Ahn, Young-woo Jeong, Seok-won Lee, Seok-won Park, Young-geun Kim
LSIS Co., Ltd., Korea

14:40-15:00 KO-800 **Simulation on Branching Phenomena of Discharge Channel in Short SF_6 Gap under Nonuniform Electric Field**
Zheng Dianchun, Ding Ning, Shen Xiangdong, Zhao Dawei
Harbin University of Science and Technology, China

Fault Current Limiting Technologies

Oct. 27 (Tue.)

Chair: Hailong He (Xi'an Jiaotong University, China) **Studio 3**

16:00-16:20 FO-355 **Experimental Research on the Current Limiting Performance of Liquid Metal Current Limiter**
Hailong He, Mingzhe Rong, Yi Wu, Zhuo Yang
Xi'an Jiaotong University, China

16:20-16:40 FO-343 **Investigation on the Development of a Resistive Superconducting Fault Current Limiter**
Yaxiong Tan, Kun Yang, Bin Xiang, Zhiyuan Liu, Yingsan Geng, Jianhua Wang, Satoru Yanabu
Xi'an Jiaotong University, China

16:40-17:00 FO-315 **DC Current Withstanding Characteristics of Superconductor**
Bin Xiang, Licai Zhang, Yaxiong Tan, Kun Yang, Zhiyuan Liu, Yingsan Geng, Jianhua Wang, S.Yanabu
Xi'an Jiaotong University, China

17:00-17:20 FO-282 **Insulation Supporter Selection for Winding in Superconducting Fault Current Limiter**
Kun Yang, Yaxiong Tan, Bin Xiang, Zhiyuan Liu, Yingsan Geng, Jianhua Wang, Satoru Yanabu
Xi'an Jiaotong University, China

17:20-17:40 FO-161 **New Standard for Electrical Grid Reliability and Energy Efficiency. Commercially Available Fault Current Limiters Enable Cost-effective Connection of Generation and Distributed Renewable Energy Sources to Transmission, Distribution and Industrial Networks**
Uri Garbi[1], Mohinder Pannu[2]
[1]GridON Ltd., Israel, [2]Wilson Transformer Company, Australia

DC Switching Technologies 1

Oct. 27 (Tue.)

Chair: Wu Yi (Xi'an Jiaotong University, China) **Studio 2**

09:00-09:20 CO-540 **Design of Test-Circuits for HVDC Circuit Breakers**
R.P.P. Smeets[1], A. Yanushkevich[1], N.A. Belda[2], R. Scharrenberg[2]
[1]DNV GL KEMA Laboratories, The Netherlands, [2]Eindhoven University of Technology, The Netherlands

09:20-09:40 CO-230 **Investigation of Novel Electromagnetic Repulsion Mechanism including Pressure Buffer**
Yifei Wu[1], Yi Wu[1], Mingzhe Rong[1], Fei Yang[1], Mei Li[1], Yang Hu[1], Jianying Zhong[2], Guiquan Han[2]
[1]Xi'an Jiaotong University, China, [2]State Grid Co.,LTD., China

09:40-10:00 CO-478 **Investigation of Suppression Effect of Short-Circuit Current and Voltage Drop in Multi-Terminal HVDC by DC Reactor**
K. Tahata, S. Tokoyoda, K. Kikuchi, M. Miyashita, K. Kamei, D. Yoshida, Y. Kono, R. Yamamoto, H. Ito
Mitsubishi Electric Corporation, Japan

DC Switching Technologies 2

Oct. 27 (Tue.)

Chair: Lars Liljestrand (ABB AB Corporate Research, Sweden) **Studio 2**

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Siyuan Liu, Yi Yang, Haoran Wang, Zhenxing Wang, Zhiyuan Liu, Yingsan Geng, Jianhua Wang
Xi'an Jiaotong University, China

11:00-11:20 CO-151 **Investigations on Load Transfer Capabilities of GIS Disconnectors for DC Grids**
P. Vinson, A. Girodet, A. Hanouna, S. Poullain
SuperGrid Institute, France

11:20-11:40 CO-302 **A DC Circuit Breaker based on Superconducting Current-limiting Technology**
Bin Xiang, Kun Yang, Yaxiong Tan, Licai Zhang, Zhiyuan Liu, Yingsan Geng, Jianhua Wang, S.Yanabu
Xi'an Jiaotong University, China

Vacuum Interrupter Technologies 3

Oct. 28 (Wed.)

Chair: Bang-Wook Lee (Hanyang University, Korea) **Studio G**

09:00-09:20 DO-585 **Numerical Simulation of Swirl Flow and Deformation of the Anode Melting Pool in High-current Vacuum Arcs Subjected to Axial Magnetic Field**
Xiaolong Huang, Lijun Wang, Shenli Jia, Zhonghao Qian, Zongqian Shi
Xi'an Jiaotong University, China

09:20-09:40 DO-503 **Thermal Effect on the Anode Electrode Surface when a High Current Interruption in Vacuum Circuit Breaker**
Yuji Nikadori, Shun Hanashiro, Eiji Kaneko
University of the Ryukyus, Japan

09:40-10:00 DO-166 **Magnetic Field and Vacuum Arc of New TMF-AMF Contact**
Min Li, Xiaoqin Wang, Wenyi Li, Shuping Sun
Tianjin Pinggao Intelligent Electric Co., Ltd., China

Vacuum Interrupter Technologies 4

Oct. 28 (Wed.)

Chair: Jaeseop Ryu (LSIS Co., Ltd., Korea) **Studio G**

10:40-11:00 DO-326 **Insulation Performance of Vacuum Interrupter after High Frequency Voltage Impulses Conditioning**
Weigang Feng[1,2], Zhiyuan Liu[1], Quan Wang[2], Peng Li[2]
[1]Xi'an Jiaotong University, China, [2]Shaanxi Baoguang Vacuum Electric Device Co., Ltd, China

11:00-11:20 DO-701 **Plastic Deformation of Electrode at Collision with Particles in Vacuum Gap**
Keisuke Abe[1], Shigeyasu Matsuoka[1], Akiko Kumada[1], Kunihiko Hidaka[1], Taiki Donen[2], Mitsuru Tsukima[2]
[1]The University of Tokyo, Japan, [2]Mitsubishi Electric Corporation Advanced Technology R&D Center, Japan

11:20-11:40 DO-449 **Anode Spot Threshold Current of Cr and Mo under Axial Magnetic Field in High Currents Vacuum Arcs**
Zaiqin Zhang, Hui Ma, Zhiyuan Liu, Yingsan Geng, Jianhua Wang
Xi'an Jiaotong University, China

11:40-12:00 DO-248 **Development of High Voltage Vacuum Interrupter with Earthed Metal Enclosure**
J.S. Ryu, C.Y. Bae, S.W. Park, Y.G. Kim
LSIS Co., Ltd., Korea

Fundamental Physics and Electrical Insulation in Switchgears 3

Oct. 28 (Wed.)

Chair: Se-Hee Lee (Kyungpook National University, Korea) **Studio 3**

09:00-09:20 GO-193 **Kinetic Model of Prestrike Arc in Vacuum Interrupters**
Zhipeng Zhou, Zhenxing Wang, Yunbo Tian, Yingsan Geng, Zhiyuan Liu
Xi'an Jiaotong University, China

09:20-09:40 GO-181 **Non-Equilibrium Effects on SF_6 Arc Plasmas in Decaying Phases**
Yasunori Tanaka[1], Katsumi Suzuki[2]
[1]Kanazawa University, Japan, [2]Tokyo Denki University, Japan

09:40-10:00 GO-466 **Calculation of Combined Diffusion Coefficients in N_2-Ar-Cu Mmixtures**
Zhexin Chen, Fei Yang, Chunlin Wang
Xi'an Jiaotong University, China

10:00-10:20 GO-189 **Kinetic Numerical Simulation of Anode Sheath of Vacuum Arcs**
Yunbo Tian, Zhipeng Zhou, Zhenxing Wang, Yingsan Geng, Jianhua Wang, Zhiyuan Liu
Xi'an Jiaotong University, China

Fundamental Physics and Electrical Insulation in Switchgears 4

Oct. 28 (Wed.)

Chair: Hong-Kyu Kim (Korea Electrotechnoloy Research Institute, Korea) **Studio 3**

10:40-11:00 GO-438 **Evaluation on Current Interruption Ability of CO_2 and SF_6 using Current and Voltage Application Highly Controlled by Power Semiconductors**
Tomoyuki Nakano[1], Kosuke Murai[1], Yasunori Tanaka[1], Yoshihiko Uesugi[1], Tatsuo Ishijima[1], Tatsuro Shiraishi[2], Takahiro Shimizu[2], Kentaro Tomita[2], Katsumi Suzuki[3], Takeshi Shinkai[4]
[1]Kanazawa University, Japan, [2]Kyushu University, Japan, [3]Tokyo Denki University, Japan, [4]Tokyo University of Technology, Japan

11:00-11:20 GO-351 **Anode Current Density Distribution in Diffuse Vacuum Arcs and Axial Magnetic Field**
Hui Ma, Yuting Zhang, Stefano Ferrari, Zaiqin Zhang, Zhiyuan Liu, Yingsan Geng, Jianhua Wang
Xi'an Jiaotong University, China

11:20-11:40 GO-306 **Influence of Copper Contamination on Dielectric Breakdown Properties of High-temperature SF_6 Gas based on Boltzmann Equation Analysis**
SenJing Yao[1], Linlin Zhong[2], Xin Zhang[1], Ronghui Huang[1], Xiaohua Wang[2], Yi Wu[2], Mingzhe Rong[2]
[1]Shenzhen Power Supply Bureau, China, [2]Xi'an Jiaotong University, China

11:40-12:00 GO-301 **Influence of Copper Contamination on Equilibrium Compositions, Thermodynamic Properties, Transport Coefficients, and Combined Diffusion Coefficients of High-temperature SF_6 Gas**
Linlin Zhong[1], Xin Zhang[2], Zhen Xiang[2], Yuming Zhao[2], Shungui Liu[2], Xiaohua Wang[1], Yi Wu[1], Mingzhe Rong[1]
[1]Xi'an Jiaotong University, China, [2]Shenzhen Power Supply Bureau, China

12:00-12:20 GO-722 **Application of Supercritical Nitrogen as a Promising Medium in Electric Equipment**
Hou Peijing[1], Zheng Qiuping[2], Zheng Dianchun[1], Zhao Dawei[1], Shen Xiangdong[1]
[1]Harbin University of Science and Technology, China, [2]Instrumentation Technology & Economy Institute, China

POSTER SESSIONS

Poster Session 1

- 15:00-16:00, Oct. 26 (Mon.)
- Grand Ballroom B
- Chairs: Hong Kyu Kim (Korea Electrotechnology Research Institute, Korea)
  Jong-Chul Lee (Gangneung-Wonju National University, Korea)

Switching Phenomena in Low-voltage Circuit Breakers and Relays

BP-203 **A Study on Compact Shunt Release Device of MCCB using a Voltage Detecting Circuit with Hysteresis**
Sung-Rok Yoo, Jeong-Won Kim, Jong-Mahn Shon, Jin-Young Park, Kil-Young Ahn, Young-Geun Kim
LSIS Co., Ltd.

BP-650 **Simulation Analysis of DC Arc in Circuit Breaker Applying with Conventional Black Box Arc Model**
Sung-Woo Lim[1], Umer Amir Khan[1], Jogn-Geon Lee[1], Bang-Wook Lee[1], Kil-Sou Kim[2], Chi-Wuk Gu[2]
[1]Hanyang University, Korea, [2]VITZROTECH Co., Ltd., Korea

BP-737 **Spectroscopic Investigations of the Ablated Species from the Polymers Exposed to Electric Arcs in Air**
Venkatesh Doddapaneni[1], Jesper Magnusson[1], Ara Bissal[1], Rudolf Gati[2], Hans Edin[1], Muhammet S. Toprak[1]
[1]KTH Royal Institute of Technology, Sweden, [2]ABB Schweiz AG, Switzerland

BP-813 **Rush-Current Breaking Properties of IGBT-Type DC Model Circuit Breaker with Different Time Constants of Gate-Emitter Voltage**
Y. Yokomizu, R. Ohashi, T. Matsumura
Nagoya University, Japan

Simulation Technologies in Switchgears

IP-289 **Interruption Simulation at Different Arcing Times for a Puffer Type 252kV SF6 Circuit Breaker**
Jin Guo, Xu Jiang, Bing Chen, Jingwei Mu
Xi'an High Voltage Apparatus Research Institute Co., Ltd., China

IP-400 **Vacuum Interrupter Optimization Technique using Sequential Approximation Method**
Yong Sung Cho, Hong Kyu Kim
Korea Electrotechnology Research Institute, Korea

IP-422 **An Analysis of Electromagnetic Characteristics and Mechanical Load Characteristics of Actuator for 4 Pole MC**
Dong-Jin Cho, Jong Sung Kang, Beung-Jin Kim, Young Ho Jin
Hyundai Heavy Industries Co., Ltd., Korea

IP-513 **High-Current Arcs Simulation in a Puffer-Assited Self-Blast Interrupter considered the Mechanical Stress**
Jong-Chul Lee[1], Won-Ho Lee[1], Hyeon-Seok Seo[2]
[1]Gangnueng-Wonju National University, Korea, [2]Sungkyunkwan University, Korea

IP-599 **The Calculation of Arc Conductance in SF_6-N_2 Mixture Gas Circuit Breaker**
Yeon-Ho Oh, Ki-Dong Song
Korea Electrotechnology Research Institute, Korea

IP-699 **Computation and Testing of Temperature Distribution in 550kV OIP Transformer Bushing**
Xin Lin[1], Miao Wen[1], Simeng Zhong[2]
[1]Shenyang University of Technology, China, [2]Liaoning Province Key Laboratory of Safe Operation & Monitoring of Power Grid, China

IP-733 **Numerical Investigation for Dynamic Characteristic Anlysis of Eletromagnetic Actuator for Gas Circuit Breakers**
Seung-Jin Kim[1], Young-li Kim[2], Heung-Ryeol Kho[2], Myeong-Seob Choi[2], Sung-Chin Hahn[1]
[1]Dong-A University, Korea, [2]ENTEC Electirc & Electronic Co.,LTD., Korea

IP-794 **Design of On-Load Tap Changer Controller based on Permanent Magnetic Actuator**
Yongxing Wang, Chen Zhang, Huan Li, Yunfeng Zhao, Zhihui Huang, Jiyan Zou
Dalian University of Technology, China

IP-797 **Relationships of Expansion Volume and Arcing Characteristics at Large Current Interruption**
Xu Jiang[1], Wenbing Zhang[1], Jin Guo[1], Xingwen Li[2]
[1]Xi'an High Voltage Apparatus Research Institute Co., Ltd, China, [2]Xi'an Jiaotong University, China

Fundamental Physics and Electrical Insulation in Switchgears

GP-178 **An Analysis of Anode Spot Formation Mechanism in High Current Vacuum Arcs**
Zaiqin Zhang[1], Guowei Kong[1,2], Zhiyuan Liu[1], Hui Ma[1], Jie Wei[2]
[1]Xi'an Jiaotong University, China, [2]Beijing SOJO Electric Co., Ltd, China

GP-244 **A Study on Improvement of Spacer's Insulation Performance for the Compact of High Voltage Power Apparatus**
Dong Hoon Jeong, Byung Hun Kim, Joo-Eon Park, Kun Ho Lee
Hyosung Corporation, Korea

GP-632 **Research on the Electric Field Distribution Characteristics of 12kV Solid Insulated Switchgear with Epoxy Mold Surface Non-Metallization**
Guowei Kong[1,2], Jie Wei[2], Haoqing Wang[3], Xiangyang Li[3]
[1]Xi'an Jiaotong University, China, [2]Beijing SOJO Electric Co., Ltd., China, [3]China Electric Power Research Institute, China

GP-656 **Fully Coupled Finite Element Analysis of Cooling Performance for Vegetable Oil-Based Magnetic Nanofluids**
Ho-Young Lee, Se-Hee Lee
Kyungpook National University, Korea

GP-670 **Experimental Study of CF_4 Insulation Performance**
Zhenxin Geng[1], Xin Lin[1], Jianyuan Xu[1], Xuebin Li[2], Xuchen Lu[2], Zhuangzhang Yang[2]
[1]Shenyang University of Technology, China, [2]State Grid Liaoning Electric Power Supply Co.Ltd., China

GP-732 **Numerical Analysis for Surface Discharge on Solid Insulation in the Dielectric Liquid**
Ho-Young Lee, Se-Hee Lee
Kyungpook National University, Korea

GP-751 **Experiment on Breakdown Characteristics of SF_6/N_2 Mixtures in Short Gap**
Xin Lin[1], Changwang Shan[1], Xintao Li[2]
[1]Shenyang University of Technology, China, [2]Liaoning Province Power Grid Operation and Monitoring of Key Laboratory, China

Others

KP-253 **Study on The Friction Characteristics of Canted Coil Spring for Gas Insulated Circuit Breaker**
Joo-Eon Park, Sung-Ho Lee
Hyosung Corporation, Korea

KP-388 **Performance Improvement of Spring Operating Mechanism for Gas Insulated Circuit Breaker by Optimizing Latch Mechanism**
Hyun Woo Kim[1], Jin Ho Kim[1], Sung Ho Lee[1], Jin Seok Jang[2], Jae Yeol Kim[1], Wan Suk Yoo[2], Byung Tae Bae[1]
[1]Hyosung Corporation, Korea, [2]Pusan National University, Korea

KP-396 **A Cam Profile Design of a Circuit Breaker by using Multibody Dynamics Analysis**
Jin-Seok Jang[1], Hyun-Woo Kim[2], Jae-Ju Lee[1], Byung-Tae Bae[2], Jeong-Hyun Sohn[3], Wan-Suk Yoo[1]
[1]Pusan National University, Korea, [2]Hyosung Corporation, Korea, [3]Pukyong National University, Korea

KP-404 **Dynamic Simulation of a High-voltage Circuit Breaker considering the Mechanical Efficiency**
Jae Yeol Kim, Jin Ho Kim, Hyun Woo Kim, Byung Hun Kim, Sung Ho Lee, Kun Ho Lee, Byung Tae Bae
Hyosung Corporation, Korea

KP-408 **EV-Relay Performance Analysis of Reverse Surge Protection Devices**
Seung-Hyun Kim, Sang-Hee Park, Young-Geun Kim, Chil-bong Na
LSIS Co., Ltd., Korea

KP-440 **Experiment and Simulation of a Coil Spring for the Performance Evaluation of a Gas Insulated Circuit Breaker**
Dae Woo Lee[1], Byung Tae Bae[2], Min Soo Kim[1], Wan Suk Yoo[3], Jae Yeol Kim[2], Jeong Hyun Sohn[1], Hyun Woo Kim[2]
[1]Pukyung National University, Korea, [2]Hyosung Corporation, Korea, [3]Pusan National University, Korea

KP-537 **Dynamic Analysis of Thomson Coil Actuator for Fast Switch of HVDC Circuit Breaker**
S. H. Park, H. J. Jang, J. K. Chong, W. Y. Lee
Korea Electrotechnology Research Institute, Korea

KP-559 **Experiment Study on Electrostatic Discharge of LEO High Voltage Solar Array**
Liying Zhu, Ming Qiao, Xiaofei Li, Qi Chen
Institute of Spacecraft System Engineering CAST, China

KP-618 **A Configuration Concept of Solid State Switch for 2kV Class DC Circuit Breaker**
Hyun-Jae Jang, Woo-Young Lee, Sang-hun Park, Jin-Kyo Chong
Korea Electrotechnology Research Institute, Korea

KP-623 **The Influence of Energy Separated Nozzle on the Gas Flow Parameters for SF_6 Circuit Breaker**
Li-Ying Li, Xiao-Ming Liu
Shenyang University of Technology, China

KP-631 **Capabilities of the Dielectric Barrier Discharge Actuator for Dual-Frequency Excitations**
Z. L. Zhang, Q. Y. Nie
Harbin Institute of Technology, China

KP-660 **New Arc Extension Circuit Design and Specifications for 4000MVA High Power Test Facility Expansion Project**
Jong-Hyuk Choi, Sang-Yun Lee, Yoon-Taek Suh, Hak-Dong Yoon, Maeng-Hyun Kim
Korea Electrotechnology Research Institute, Korea

KP-692 **Analysis of the Test Line Impedance and Strength for Short Time and Peak Withstand Test of KERI's New High Power Laboratory**
Byuk Jin Lee, Sang Hak Kim, Tae Jin Kwon, Jong Hyuk Choi, Maeng Hyun Kim
Korea Electrotechnology Research Institute, Korea

KP-762 **Voltage Drop Calculation considering Transformer Inrush Current with EDG Operation**
Jeong-Hyeok Heo, Seong-Il Kim, Joon-Ho Kim, Soo-Nam Kim
Hyundai Heavy Industries Co., Ltd., Korea

Poster Session 2

- 15:00-16:00, Oct. 27 (Tue.)
- Grand Ballroom B
- Chairs: Jinho Kim (Hyosung Corporation, Korea)
  Se-Hee Lee (Kyungpook National University, Korea)

Switching Phenomena in High-voltage Systems

AP-276 **Study on Transient Recovery Voltage for Testing of High-voltage Circuit Breakers**
Hee-Cheol Lee, Ji-Hoon Park, Young-Geun Kim
LSIS Co., Ltd., Korea

AP-287 **Development of Permanent Magnetic Actuator for a Solid Insulated Vacuum Circuit Breaker**
E Jae Choi, Ji-Hoon Ma
LSIS Co., Ltd., Korea

AP-434 **Why is MV Switch-fuse So Well Adapted to Public Distribution Applications?**
Jean-Marc Biasse[1], Dominique Serve[1], Didier Fulchiron[1], Juan-Carlos Perez Quesada[2], Yong Yang[3], Gang-Jack Wang[3]
[1]Schneider Electric, France, [2]Schneider Electric, Spain, [3]Schneider Electric, China

AP-636 **Analysis of Insulation Cooperation for Dual Motion Mechanism Gas Circuit Breaker**
Mincheol Kang[1], Kyounghoe Kim[1], Taiho Ohk[1], Yong Tae Yoon[2]
[1]ILJIN Electric, Korea, [2]Seoul National University, Korea

AP-661 **Study on Distribution Characteristics of Surface Potential in Extra-high GIS**
Jianyuan Xu[1], Sha Hao[1], Yinhua Lu[2]
[1]Shenyang University of Technology, China, [2]Liaoning Province Key Laboratory of Safe Operation & Monitoring of Power Grid, China

AP-706 **Analysis on Influences of Transient Over-voltage by Vacuum Circuit Breakers Operation in 35kV PV-LVRT Experiment**
Jianyuan Xu[1], Guannan Wu[1], Xu Tang[1], Deshun Wang[2]
[1]Shenyang University of Technology, China, [2]China Electric Power Research Institute, China

AP-779 **Analysis of Interrupting Characteristics for O-CO Operation of Self-blast Type Circuit Breakers**
Tae-hun Song, Hee Sang Sohn, Jin Ho Jun
Hyundai Heavy Industries Co., Ltd., Korea

AP-798 **Detection of Early Failures within Traction Transformers based on Gaussian-PSO**
Jiaojiao Zhu[1], Tefang Chen[1], Qiang Fu[2], Shu Cheng[1]
[1]Central South University, China, [2]Changsha University of Science and Technology, China

DC Switching Technologies

CP-292 **Study on the Low Voltage DC Short-circuit Test and DC Test Equipment**
Chan-Moon Hwang, Ji-Hoon Park, Young-Geun Kim
LSIS Co., Ltd., Korea

CP-494 **Medium Voltage DC Vacuum Circuit Breaker**
Lars Liljestrand[1], Magnus Backman[1], Lars Jonsson[1], Marco Riva[2], Edgar Dullni[3]
[1]ABB Corporate Research, Sweden, [2]ABB s.p.a – Italy, Italy, [3]ABB AG, Germany

CP-520 **Comparison of Inverse Current Injecting HVDC Curcuit Breaker**
B.C. Kim[1], Y.H. Chung[1], H.D. Hwang[1], H.S. Mok[2]
[1]Hyosung Corporation, Korea, [2]Konkuk University, Korea

CP-625 **Experimental Study of the Current Commutation in Hybrid DC-breakers**
Jesper Magnusson[1], Ara Bissal[1], Juan A. Martinez[2], Lars Liljestrand[3], Göran Engdahl[1]
[1]KTH Royal Institute of Technology, Sweden, [2]Universitat Politècnica de Catalunya, Spain, [3]ABB AB, Sweden

Vacuum Interrupter Technologies

DP-264 **Inrush Current Arc Characteristics in Vacuum Interrupters with Axial Magnetic Field Contact and Butt-Type Contact**
Yun Geng, Yongxiang Yu, Yingsan Geng, Jianhua Wang, Zhiyuan Liu
Xi'an Jiaotong University, China

DP-274 **Inrush Current Prestriking Arc Behaviors of Vacuum Interrupters under CuCr50/50 and CuW10/90 Contact Materials**
Yongxiang Yu, Yun Geng, Yingsan Geng, Jianhua Wang, Zhiyuan Liu
Xi'an Jiaotong University, China

DP-336 **Investigation of Relation between Miniaturization of Cr and Breakdown Characteristics of CuCr Electrode in Vaccum**
Naoki Asari, Tetsu Shioiri, Kenichi Miyazato, Yo Sasaki, Atsuhi Yamamoto, Kohei Yasuda
Toshiba Corporation, Japan

DP-342 **Research on VCB Breaking Control Method in Multi Paralleled Breaks**
Xiang Zheng[1], Chenxu Niu[2]
[1]Dalian Jiaotong University, China, [2]Xinlian College of Henan Normal University, China

DP-498 **Back-to-back Capacitor Bank Switching Performance of Vacuum Circuit Breaker by Series Technology**
Feng Zhao[1,2], Biao Hu[1,2], Zhiyuan Liu[1], He Yang[2], Yongxiang Yu[1], Yingsan Geng[1], Jianhua Wang[1]
[1]Xi'an Jiaotong University, China, [2]Power Distribution Assembly R&D Group Electrical Sector APAC Eaton, China

DP-507 **Investigation about Influence on Breakdown Voltage by Arc Condition before Quenching**
Ryoji Oshiro, Eiji Kaneko
University of the Ryukyus, Japan

DP-548 **Micro-structure and Performance of Vacuum Consumable Arc Melting Copper Chromium Contact Material**
Peng Li, Xuan Ai, Wenbin Wang, Xiaojun Wang, Gang Li
ShaanXi Sirui Industries Co., LTD, China

DP-556 **Splitting of Vacuum Arc Column in Transverse Magnetic Field Contacts at Intermediate-Frequency**
Liying Zhu[1], Ming Qiao[1], Jianwen Wu[2], Bo Cui[1]
[1]Institute of Spacecraft System Engineering CAST, China, [2]Beihang University, China

DP-606 **Composite Insulation Structure for Medium Voltage Class Switchgear**
Takamitsu Hae, Kunihiko Tomiyasu, Takashi Sato, Tomoaki Utsumi, Ayumu Morita, Kenji Tsuchiya, Naoya Okada
Hitachi, Ltd., Japan

DP-727 **Characteristics of Vacuum Arc Influenced by Radial Magnetic Field Employing Simplified Arc Model**
Chang-Seob Kwak, Se-Hee Lee
Kyungpook National University, Korea

DP-783 **The Characteristic Evaluation of Brazing Joint according to the Ni Plating to One-side of the Base Metal**
Duck-Hwan Yoon, Gi-Beom Jeon, Heung-Jin Ju, Chi-Wuk Gu
Vitzrotech Co. Ltd.

DP-788 **Reliability Assessment of Permanent Magnetic Actuator for Vacuum Circuit Breaker**
Yongxing Wang, Yang Liu, Yan Mu, Xujing Zhao, Zhihui Huang, Jiyan Zou
Dalian University of Technology, China

Fault Current Limiting Technologies

FP-213 **Application of Fault Current Limiter in 22.9 kV KEPCO Grid**
Min Jee Kim[1], Kyungwon Park[1], Kil-Young Ahn[1], Young-Geun Kim[1], Dong-Kyun Lim[2]
[1]LSIS Co., Ltd., Korea, [2]Korea Electric Power Corporation, Korea

FP-252 **Current Limiting Protection in the Spacecraft Power System**
Haiping Shi, Changjiang Zhao, Yuanliang Jin, Yanli Liu
Beijing Institute of Spacecraft System Engineering, China

FP-648 **Fault Current Characteristics of Multi-Terminal HVDC System**
Jong-Geon Lee[1], Umer Amir Khan[1], Sung-Woo Lim[1], Ho-Yun Lee[1], Bang-Wook Lee[1], Young-Geun Kim[2], JungWook Sim[2]
[1]Hanyang University, Korea, [2]LSIS Co., Ltd., Korea

Emerging High Voltage Switching Technologies

HP-346 **Research on Mechanical Reliability of a Permanent Magnetic Actuator for a 126kV Vacuum Circuit Breaker**
Haomin Li, Liqiong Sun, Xiaofei Yao, Yingsan Geng, Zhiyuan Liu, Jianhua Wang
Xi'an Jiaotong University, China

HP-654 **A Comparative Study on Electrical and Thermal Stress Distribution across Fundamental Components of Conventional and Superconducting Hybrid Type HVDC Circuit Breakers**
Umer Amir Khan[1], Jong-Geon Lee[1], Sung-Woo Lim[1], Bang-Wook Lee[1], Young-Geun Kim[2], JungWook Sim[2]
[1]Hanyang University, Korea, [2]LSIS Co., Ltd., Korea

HP-756 **Research on the Synchronous Control Device of Motor Actuator used in 126kV Vacuum Circuit Breaker**
Jianyuan Xu[1], Jiao Zhang[1], Kejian Shi[2], Wei Lei[2]
[1]Shenyang University of Technology, China, [2]Liaoning Province Power Grid Operation and Monitoring of Key Laboratory, China

Testing Technologies in Switchgears

JP-532 **Time-resolved Ablation Performance of Polymers as Wall Materials for Switching Applications**
Bin Ma, Zichi Zhang, Andreas Friberg
ABB Corporate Research, Sweden

JP-565 **Verification of the Dielectric Withstand between the Live Part and the Enclosure during the Transformer Capacitive Synthetic Tests for Dead-tank Breaker**
Jin-Hwan Kim, Jung-Hyeon Ryu
Korea Electrotechnology Research Institute, Korea

JP-608 **A Study on the Development of AC and DC Short-circuit Test Facility for the Low-voltage Protective Equipment**
Dong-Su Kim[1], Jae-Nam Ryu[1], Chul-Hwan Kim[2]
[1]Korea Electrotechnology Research Institute, Korea, [2]Sungkyunkwan University, Korea

JP-613 **Intercomparison Test on High Current Shunts for High Power Testing with STL Reference Shunt**
Min Kyu Kim, Jung Hyeon Ryu, Chan Gyo Park, Ik Soo Kim, Yong Han Lee, Hyeong Kee Rhyou, Jong Hoon Han
Korea Electrotechnology Research Institute, Korea

JP-640 **Implementation of Robust Current Zero Anticipator for Parallel Current Injection Synthetic Testing**
Kyoung-Jun Lee, Yun-Seong Kim, Jung-Hyeon Ryu, Seung-Jae Park, Hyeong-Kee Rhyou
Korea Electrotechnology Research Institute, Korea

JP-647 **Performance Analysis of Prospective TRV with TRV Analyzer**
Minchae Jung
Korea Electrotechnology Research Institute, Korea

JP-676 **Research on Fault Diagnosis Method of Circuit Breaker Mechanical Characteristics based on Relevance Vector Machine**
Xin Lin, Chen Cao, Jian-yuan Xu
Shenyang University of Technology, China

JP-785 **PD Pattern Recognition in Metal-clad Switchgear by using UHF Technology**
Dohoon Lee, Jinho Lee, Jong-Woong Choe, Seok-Weon Park, Young-Kun Kim
LSIS Co., Ltd., Korea

JP-809 **The Study of the Strategy of Low Frequency Load Shedding of Grid Frequency**
Guan Xin, Tan Jun, Zhao Jinyue
Shenyang University of Technology, China