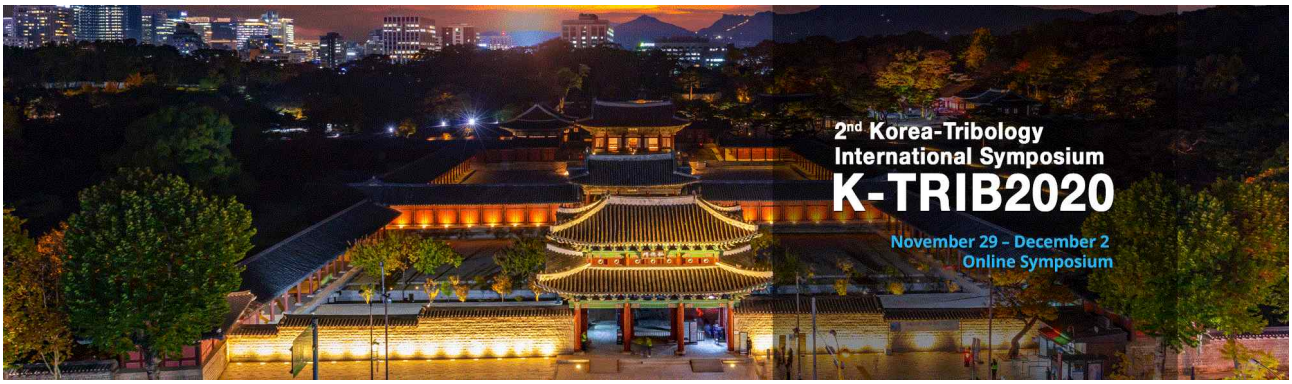
K-TRIB2020



K-TRIB2020 Tentative Program (ver.1)

(As of Nov.12)

2nd Korea-Tribology International Symposium

November 29 - December 2, 2020

Online Symposium

I. Program at a Glance

Keynote Talk [KT]

[P00164] Hyo-Sok Ahn (Seoul National Univ. of Science and Technology)
[P00261] Michel Fillon (Univ. of Poitiers)

Invited Talk [IT]

[P00055] Roland Bennewitz (INM - Leibniz Institute for New Materials)
[P00059] Masanobu Kubota (Kyushu Univ.)
[P00067] Satish Vasu Kailas (Indian Institute of Science)
[P00099] Reza Talemi (Univ. of Leuven)
[P00101] Hakan Kaleli (Yildiz Technical Univ.)
[P00135] Daniele Dini (Imperial College London)
[P00221] José Alexander Araújo (Univ. of Brasília)
[P00266] Noritsugu Umehara (Nagoya Univ.)
[P00306] Koo-Hyun Chung (Univ. of Ulsan)

Oral Session

Coatings and Thin Films [CFO]

[P00080] Young-Jun Jang (Korea Institute of Materials Science)
[P00081] Youjin Min (Yonsei Univ.)
[P00102] Hakan Kaleli (Yildiz Technical Univ.)
[P00204] Wooyoung Lee (Nagoya Univ.)
[P00248] Hyeseon Park (Univ. of Ulsan)
[P00144] Ashutosh Sharma (Ajou Univ.)
[P00195] Shreeharsha H. Ramaswamy (The Univ. of Tokyo)
[P00231] Franklin, Issac R. (Anna Univ.)
[P00282] Chia Yaw Yap (Universiti Malaysia Sabah)

Contact Mechanics [CMO]

[P00154] Kyeongmin Kim (Yonsei Univ.)
[P00183] Takazumi Yamada (Nagoya Univ.)
[P00223] Ilkwang Jang (Yonsei Univ.)
[P00281] Ivan Argatov (Technische Universität Berlin)
[P00291] Shangjie Xu (Beijing Institute of Technology)
[P00305] Zhenni Xu (Harbin Institute of Technology, Shenzhen)
[P00061] Kwangmin Lee (Sogang Univ.)

Fundamentals of Friction and Wear [FWO]

[P00024] Franklin, Issac R. (Anna Univ.)
[P00036] Haomiao Yuan (Ostwestfalen-Lippe Univ. of Applied Sciences and Arts)
[P00103] Ziyan Man (The Univ. of Sydney)
[P00277] Kazuo Arakawa (Kyushu Univ.)
[P00286] Ryosuke Masutani (Nagoya Institute of Technology)
[P00072] Sri Chaitanya Ch (National Institute of Technology Warangal)
[P00228] Ashokraj Jayachandran (Gitam School of Technology, Bangalore)

Lubricants and Tribo-Chemistry [LTO]

[P00069] Takumi Kani (Nagoya Univ.)
[P00132] Yeonjin Jung (Texas Tech Univ.)
[P00275] David Blanco Alonso Univ. of Oviedo)
[P00289] Sohrab Entezami Lahijani (Univ. of British Columbia)
[P00308] Jin Zhang Chinese Academy of Sciences)
[P00068] Reza Taheri (Univ. of Wollongong)

Lubrication [LUO]

[P00158] Tatsuya Suzuki (Nagoya Univ.)
[P00159] Naoya Fusetani (Nagoya Univ.)
[P00190] Wonvin Kim (KAIST)
[P00207] Marco Freschi (Politecnico di Milano)
[P00284] Tatsuya Inagaki (Nagoya Institute of Technology)
[P00307] Shusheng Xu (Lanzhou Institute of Chemical Physics)
[P00178] Nasrya F. Kossoko (Ecole Centrale De Lyon, ECL)
[P00302] Zhan Liu (Shanghai Jiaotong Univ.)

Micro/Nano-Tribology [MNO]

[P00066] Tomoyasu Watanabe (Nagoya Univ.)
[P00209] Prashant Pendyala (Korea Institute of Science and Technology)
[P00243] Chan Kim (Univ. of Science and Technology, UST)
[P00192] Joong Il Jake Choi (Institute for Basic Science, IBS)
[P00206] Jaesang Yoo (SungKyunKwan Univ.)
[P00225] Charchit Kumar (Université de Strasbourg)

Surfaces and Interfaces [SIO]

[P00083] Takaaki Miyachi (Nagoya Univ.)
[P00272] Tomohiro Saso (Nagoya Univ.)
[P00311] Ming Luo (The Univ. of Sydney)
[P00175] Andreas Trausmuth (AC^2T Research Gmbh)
[P00253] Tae-Jo Park (Gyeongsang National Univ.)

Tribology of Machine Elements and Systems [TMO]

[P00109] Hyunjung Oh (Seoul National Univ.)
[P00156] Kouki Imai (Saitama Institute of Technology)
[P00181] Alan Hase (Saitama Institute of Technology)
[P00215] Vishwadeep Handikherkar (VJTI Mumbai)
[P00279] Konstantinos Tsatsoulis (Univ. of Patras)
[P00280] Anastasios Zavos (Univ. of Patras)
[P00287] Vishal Mourya (Motilal Nehru National Institute of Technology Allahabad)
[P00290] Jingwei Xiao (Beijing Institute of Technology)
[P00316] Junho Suh (Pusan National Univ.)
[P00146] Tomohiro Saso (Nagoya Univ.)
[P00210] Vaibhav A. Kalhapure (Veermata Jijabai Technological Institute (VJTI))
[P00211] H. P. Khairnar (Veermata Jijabai Technological Institute (VJTI))
[P00250] Syed Muntazir Mehdi (Kookmin Univ.)
[P00252] Sung Ho Hwang (Kookmin Univ.)

Poster Session

Coatings and Thin Films [CFP]

[P00030] Kuk-Jin Seo (Yonsei Univ.)
[P00073] Mahdi Khadem (Yonsei Univ.)
[P00149] Yuzhen Liu (Yonsei Univ.)
[P00189] Platon Karaseov (Peter the Great St.-Petersburg Polytechnic Univ.)
[P00201] Tae-Hyeong Kim (Yonsei Univ.)
[P00226] Young-Jun Jang (Korea Institute of Materials Science)
[P00234] Min Ki Ji (Incheon National Univ.)
[P00313] Selim Park (Korea Polytechnic Univ.)
[P00166] Julya Popova (Lomonosov Moscow State Univ.)
[P00182] Andrey Belmesov (IPCP RAS)
[P00184] Grigory Nechaev (IPCP RAS)
[P00242] Vishnu Shankar Dhandapani (Yonsei Univ.)
[P00317] Vladimir Pukha (Institute of Problems of Chemical Physics of RAS)

Contact Mechanics [CMP]

[P00141] Hyung-Kyu Kim (Korea Atomic Energy Research Institute)
[P00249] Sang-Kyu An (Korea Air Force Academy)
[P00273] Wei Li (South China Univ. of Technology)

Fundamentals of Friction and Wear [FWP]

[P00292] Decelyne Elly Binjua (Universiti Malaysia Sabah)
[P00293] Angel Sui Yee Hau (Universiti Malaysia Sabah)
[P00301] Seonghyun Park (Tongmyong Univ.)

Lubrication [LUP]

[P00283] Nuratika Shaheera Rahama (Universiti Malaysia Sabah)

Micro/Nano-Tribology [MNP]

[P00197] Chang-Lae Kim (Chosun Univ.)
[P00246] Min-Ah Yoon (Univ. of Science and Technology, UST)
[P00150] Rafail Apakashev (Ural State Mining Univ.)
[P00171] Dooho Lee (KAIST)

Surfaces and Interfaces [SIP]

[P00114] Jiwon Choi (Yonsei Univ.)
[P00142] Young-Ho Lee (Korea Atomic Energy Research Institute)
[P00196] Jungyu Son (Tongmyong Univ.)
[P00235] In-Ha Sung (Hannam Univ.)
[P00241] Mu Yeon Jang (Pukyong National Univ.)
[P00259] Jun-Suek Ro (Sun Moon Univ.)
[P00314] Jingyu Kim (Korea Polytechnic Univ.)

Tribology of Machine Elements and Systems [TMP]

[P00163] Chanhyun Son (Schaeffler Korea)
[P00240] Tae Wan Kim (Pukyong National Univ.)
[P00244] Wonjun Seo (Tongmyong Univ.)
[P00247] Ngoc-Phat Huynh (Univ. of Ulsan)
[P00264] Joonhwan Bae (Korea Aerospace Research Institute)
[P00276] Chenglong Zhong (Beijing Institute of Technology)
[P00299] Pengju Li (Xi'An Univ. of Architecture and Technology)
[P00155] Kangseok Kim (Schaeffler Korea)
[P00161] Minhwan Kim (Schaeffler Korea)

Young Korean Researchers Agora

Student Research & Design Exchange (SRD)

[P00030] Kuk-Jin Seo (Yonsei Univ.)
[P00081] Youjin Min (Yonsei Univ.)
[P00109] Hyunjung Oh (Seoul National Univ.)
[P00114] Jiwon Choi (Yonsei Univ.)
[P00154] Kyeongmin Kim (Yonsei Univ.)
[P00190] Wonvin Kim (KAIST)
[P00196] Jungyu Son (Tongmyong Univ.)
[P00201] Tae-Hyeong Kim (Yonsei Univ.)
[P00234] Min Ki Ji (Incheon National Univ.)
[P00244] Wonjun Seo (Tongmyong Univ.)
[P00246] Min-Ah Yoon (Univ. of Science and Technology, UST)
[P00248] Hyeseon Park (Univ. of Ulsan)
[P00249] Sang-Kyu An (Korea Air Force Academy)
[P00259] Jun-Suek Ro (Sun Moon Univ.)
[P00301] Seonghyun Park (Tongmyong Univ.)
[P00313] Selim Park (Korea Polytechnic Univ.)
[P00314] Jingyu Kim (Korea Polytechnic Univ.)
[P00061] Kwangmin Lee (Sogang Univ.)
[P00171] Dooho Lee (KAIST)
[P00206] Jaesang Yoo (SungKyunKwan Univ.)
[P00252] Sung Ho Hwang (Kookmin Univ.)

Young Professionals Festa (YPF)

[P00197] Chang-Lae Kim (Chosun Univ.)
[P00223] Ilkwang Jang (Yonsei Univ.)
[P00243] Chan Kim (Univ. of Science and Technology, UST)
[P00264] Joonhwan Bae (Korea Aerospace Research Institute)
[P00192] Joong Il Jake Choi (Institute for Basic Science, IBS)

Lubricants Symposium (LUS)

[P00297] Yvonne Koay (Lubrizol)
[P00298] Yungwan Kwak (Afton Chemical Corporation)
[P00294] Jinho Song (Infineum)
[P00295] Erik Willett (Functional Products Inc.)
[P00312] Daeho Kim (Doosan Infracore)

II. Symposium Program (Detailed Program)

1. Keynote Talk

KT-1
[P00164] **Scanning Probe Microscopy and Fabrication of Probes for Efficient Characterization of Worn Surface**
Hyo-Sok Ahn (Seoul National Univ. of Science and Technology)

KT-2
[P00261] **Influence of Deformations and Geometrical Defects on Hydrodynamic Textured or Untextured Surface Sliding Bearing Performance**
Michel Fillon, Anastasios Charitopoulos (Univ. of Poitiers)
Christos Papadopoulos (NTUA)

2. Invited Talk

IT-1
[P00055] **Molecular Mechanisms in the Control of Friction**
Roland Bennewitz (INM - Leibniz Institute for New Materials)

IT-2
[P00059] **Effect of Hydrogen on Fretting Fatigue Strength**
Masanobu Kubota (Kyushu Univ.)
Ryosuke Komoda (Fukuoka Univ.)

IT-3
[P00067] **Studies on Stribeck Curve Using a Force Controlled Tribometer**
Satish Vasu Kailas, Pranay Likhar (Indian Institute of Science)

IT-4
[P00099] **Effects of Tribological Behaviour on Fatigue Fracture of Materials**
Reza Talemi (Univ. of Leuven)
André Luis Pinto, José Alexander Araújo (Univ. of Brasília)

IT-5
[P00101] **Tribological Performance of Innovated Reduced Graphene Oxide Suspended as Additive in Engine Commercial Oil**
Hakan Kaleli, Selman Demirtas, Veli Uysal (Yildiz Technical Univ.)
Ioannis Karnis, Minas Stylianakis (Hellenic Mediterranean Univ.)
Dae-Eun Kim (Yonsei Univ.)

IT-6
[P00135] **Unravelling The Mysteries of Friction and Lubrication through Simulated Experiments across the Scales**
Daniele Dini (Imperial College London)

IT-7
[P00221] **Fretting Fatigue: Wear Effects on the Modelling of Initiation Life and Applications**
José Alexander Araújo (Univ. of Brasília)
Luis Filipe Galrão dos Reis (Instituto Superior Técnico)
Fábio Comes de Castro, Raphael Araújo Cardoso (Univ. of Brasília)

IT-8
[P00266] **Improvement of Surface Quality with Solid Lubricating Sheet for Drilling Aircraft Materials**
Noritsugu Umehara (Nagoya Univ.)

IT-9
[P00306] **Surface Damage Characteristics of Two-Dimensional Materials**
Koo-Hyun Chung, Ngoc-Phat Huynh (Univ. of Ulsan)

3. Oral Presentations

Coatings and Thin Films (CFO)

CFO-1
[P00080] **Tribological Properties of Defect Free ta-C Thick Coating with Filtered Cathodic Vacuum Arc**
Young-Jun Jang, Jongkuk Kim (Korea Institute of Materials Science)
Wooyoung Lee, Jaeil Kim, Noritsugu Umehara (Nagoya Univ.)
Seock-Sam Kim (Universiti Malaysia Sabah)

CFO-2
[P00081] **Effect of Substrate on the Tribological Characteristics of Graphene Films**
Youjin Min, Kyeong-Hee Kang, Dae-Eun Kim (Yonsei Univ.)

CFO-3
[P00102] **Wear and Lubrication Effect of Reduced Graphene Oxide Coating by EPD Method on Engine Cylinder Liner with Variable Honed Angles**
Hakan Kaleli, Veli Uysal (Yildiz Technical Univ.)

CFO-4
[P00204] **The Influence of Duct Bias on Their Tribological Behavior of ta-C Coating Produced by FCVA Method**
Wooyoung Lee (Nagoya Univ.)
Young-Jun Jang (Korea Institute of Materials Science)
Takayuki Tokoroyama, Motoyuki Murashima, Noritsugu Umehara (Nagoya Univ.)

CFO-5
[P00248] **Enhancement of Surface Reliability of Marine Engine Components Using DLC Film**
Hyeseon Park (Univ. of Ulsan)
Hyang Lee, Sang Don Lee (Hyundai Heavy Industries Co., Ltd.)
Koo-Hyun Chung (Univ. of Ulsan)

CFO-6
[P00144] **Effect of Plating Current Density on the Ball-on-Disc Wear of Sn and Ni-Sn Alloyed Coatings**
Ashutosh Sharma, Myoung Jin Chae, Byungmin Ahn (Ajou Univ.)

CFO-7
[P00195] **Diamond-Like Carbon Based Triboelectric Nanogenerator for Bearing Applications**
Shreeharsha H. Ramaswamy, Junho Choi (The Univ. of Tokyo)

CFO-8
[P00231] **Contact Mechanism of DLC Coated Titanium-UHMWPE Interface**
Franklin, Issac R., Elayaperumal, A. (Anna Univ.)

CFO-9
[P00282] **Tribological Behaviour of Single and Multilayer ta-C Coated Layer on High-Speed Steel**
Chia Yaw Yap, Seock-Sam Kim (Universiti Malaysia Sabah)
Jong-Kuk Kim, Young-Jun Jang, Jae-Il Kim (Korea Institute of Materials Science)

Contact Mechanics (CMO)

CMO-1
[P00154] **Effect of Adhesion on a Beam with Surface Effects Lifted from the Ground**
Kyeongmin Kim, Yong Hoon Jang (Yonsei Univ.)

CMO-2
[P00183] **Enhancing the Lifetime of MoS_2 Coating with the Friction Control Method**
Takazumi Yamada, Motoyuki Murashima, Noritsugu Umehara, Takayuki Tokoroyama (Nagoya Univ.)

CMO-3
[P00223] **Estimation of Real Contact Spot Distribution Using Deep Learning**
Ilkwang Jang, Yong Hoon Jang (Yonsei Univ.)

CMO-4
[P00281] **An Analytical Model for Gross-Slip Fretting Wear Contact with Variable Coefficient of Friction**
Ivan Argatov (Technische Universität Berlin)
Joon Woo Bae, Young Suck Chai (Yeungnam Univ.)

CMO-5
[P00291] **Determination of Friction Coefficient Based on Adhesion Theory by Finite Element Method**
Shangjie Xu, Wenjie Qin, Jingwei Xiao, Xudong Li (Beijing Institute of Technology)

CMO-6
[P00305] **Research on Static Characteristics of Double Bump Gas Foil Bearing Based on Contact Mechanics**
Zhenni Xu, Changlin Li, Jianjun Du (Harbin Institute of Technology, Shenzhen)

CMO-7
[P00061] **Analysis of Spherical Tip Size Effect on Brittle-to-Ductile Transition in Brittle Materials**
Kwangmin Lee, Karuppasamy Pandian Marimuthu, Hyungyil Lee (Sogang Univ.)

Fundamentals of Friction and Wear (FWO)

FWO-1
[P00024] **Tribological Investigation on Biodegradable Collagen Reinforced UHMWPE Composites for Bio Implant Application**
Franklin, Issac R., Elayaperumal, A. (Anna Univ.)

FWO-2
[P00036] **Fretting Corrosion of Different Metals in Vacuum**
Haomiao Yuan, Jian Song (Ostwestfalen-Lippe Univ. of Applied Sciences and Arts)

FWO-3
[P00103] **Wear Performance of Additive Manufactured Polymer Composites Reinforced by Continuous Carbon Fibers**
Ziyan Man, Qinghao He, Li Chang (The Univ. of Sydney)

FWO-4
[P00277] **Experimental and Model Analyses of Plowing Friction**
Kazuo Arakawa (Kyushu Univ.)

FWO-5
[P00286] **In-situ Observation of Real Contact Area of Rubber Material Sliding on Rough Surface**
Ryosuke Masutani, Satoru Maegawa, Fumihiro Itoigawa (Nagoya Institute of Technology)

FWO-6
[P00072] **Erosive Wear Resistance Properties of the CFRP Composites**
Sri Chaitanya Ch, Narasimha Rao R. (National Institute of Technology Warangal)

FWO-7
[P00228] **Synergetic Effect of Plastic Deformation Mechanisms, Tribo Chemical Reactions and Mechanically Mixed Layers in Tribology of Ti-6Al-4V under Ambient and Vacuum Conditions**
Ashokraj Jayachandran (Gitam School of Technology, Bangalore)
Satish Vasu Kailas (Indian Institute of Science, Bangalore)

Lubricants and Tribo-Chemistry (LTO)

LTO-1
[P00069] **The Tribological Property of DLC under Lubrication with New Additive Having Phosphate and Hydroxy Group**
Takumi Kani, Takayuki Tokoroyama, Noritsugu Umehara, Motoyuki Murashima (Nagoya Univ.)
Kazuhiro Yagishita (JXTG Corporation)

LTO-2
[P00132] **Temperature Dependent Material Behavior of Molecularly Thin Lubricants on Magnetic Recording Media**
Yeonjin Jung, Shahriar Rahman, Jingan Song, Chang-Dong Yeo (Texas Tech Univ.)

LTO-3
[P00275] **Bacterial Toxicity and Biodegradability of Ionic Liquids to be Used in Lubrication**
David Blanco Alonso, Paula Oulego, Javier Faes, Rubén González, Jose Luis Viesca, Antolín Hernández Battez (Univ. of Oviedo)

LTO-4
[P00289] **Tribological and Rheological Characterization of Cellulose Nano-Crystalline (CNC) Suspensions**
Sohrab Entezami Lahijani, Behzad Zakani (Univ. of British Columbia)
Hayder Salem, Ahmad Sedaghat (Australian College of Kuwait)
Dana Grecov (Univ. of British Columbia)

LTO-5
[P00308] **Molecular Dynamics Simulation on the Interaction between Base Oil and Nano-palygorskite Additive**
Jin Zhang, Lv Yang, Yue Wang, Huaichao Wu, Jiabin Cai (Guizhou Univ.)
Shusheng Xu (Chinese Academy of Sciences)

LTO-6
[P00068] **Environmentally Friendly Nanoparticle-Functionalised Soybean Oil-in-Water Emulsion Lubricant for Cold Rolling Processes**
Reza Taheri, Buyung Kosasih (Univ. of Wollongong)

Lubrication (LUO)

LUO-1
[P00158] **Effect of Mating Material on Friction Property of ta-C Film at High Temperature in Water**
Tatsuya Suzuki, Noritsugu Umehara, Takayuki Tokoroyama, Motoyuki Murashima (Nagoya Univ.)
Kazuhito Yoshida, Masashi Hosokawa, Takashi Honda, Kyoji Inukai (Denso-Corporation)

LUO-2
[P00159] **In-situ Observation of Rolling Friction Sliding Part Using Fluorescent Fine Particles of Multiple Sizes**
Naoya Fusetani, Takayuki Tokoroyama, Noritugu Umehara, Motoyuki Murashima (Nagoya Univ.)

LUO-3
[P00190] **A Study of Elastohydrodynamic Lubrication for the Water-lubricated Composite Journal Bearing**
Wonvin Kim, Seong Su Kim (KAIST)

LUO-4
[P00207] **Employment of Micro- and Nano- WS_2 Structures to Enhance the Tribological Properties of Copper-Matrix Composite Material**
Marco Freschi, Gabriele Zanardi, Saverio Latorrata, Marco Mariani, Nora Lecis, Giovanni Dotelli (Politecnico di Milano)

LUO-5
[P00284] **A Novel Method for Visualizing Oil Film Pressure Distribution on Sliding Surface Using Surface Plasmon Resonance Technology**
Tatsuya Inagaki, Xiaoxu Liu, Satoru Maegawa, Fumihiro Itoigawa (Nagoya Institute of Technology)

LUO-6
[P00307] **Solid Lubricant Films for Spacecraft**
Shusheng Xu, Xiaoming Gao, Lijun Weng, Feng Zhou (Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences)
Dae-Eun Kim (Yonsei Univ.)
Weimin Liu (Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences)

LUO-7
[P00178] **Tribological Behaviour of Polymer Friction Modifier (PFM) in Steel/Steel Contact**
Nasrya F. Kossoko, Clotilde Minfray, Frédéric Dubreuil, Jules Galipaud, Benoît Thiébaut2and Michel Belin (Ecole Centrale De Lyon, ECL)

LUO-8
[P00302] **Starved Lubrication Analysis for the Compression Ring of a Two-Stroke Marine Diesel Engine with Considering the Effects of Textures**
Zhan Liu, Xianghui Meng (Shanghai Jiaotong Univ.)

Micro/Nano-Tribology (MNO)

MNO-1
[P00066] **The In-situ Observation of Imitation Wear Particles at Rolling Friction Contact Point by Fluorescent Staining Method**
Tomoyasu Watanabe, Takayuki Tokoroyama, Noritsugu Umehara, Motoyuki Murashima (Nagoya Univ.)
Tetsuya Sato, Takeichi Muramatsu, Yoshihiro Asada (Univance Corporation)

MNO-2
[P00209] **Study of the Role of Contact Area and Stiffness on Adhesion and Friction at Nanoscale Using Well-Defined Polymer Patterns**
Prashant Pendyala (Korea Institute of Science and Technology)
Harpreet Singh Grewal (Shiv Nadar Univ.)
Eui-Sung Yoon (Korea Institute of Science and Technology)

MNO-3
[P00243] **Damage Mechanisms of CVD Graphene in Dry Transfer Process**
Chan Kim, Min-Ah Yoon (Univ. of Science and Technology, UST)
Bongkyun Jang, Jae-Hyun Kim (Korea Institute of Machinery and Materials, KIMM)
Hyun-Jun Jung (Center for Advanced Meta-Materials, CAMM)
Hak-Joo Lee, Kwang-Seop Kim (Korea Institute of Machinery and Materials, KIMM)

MNO-4
[P00192] **Surface Termination-Dependent Nanotribological Properties of Single-Crystal MAPbBr3 Surfaces**
Joong Il Jake Choi (Institute for Basic Science, IBS)
Muhammad Ejaz Khan (KAIST)
Zafer Hawash (OIST)
Hyunhwa Lee (KAIST)
Luis Katsuya Ono, Yabing Qi (OIST)
Yong-Hoon Kim, Jeong Young Park (KAIST)

MNO-5
[P00206] **Identification of Micro-particle Generation Mechanisms through Friction Tests of Brake Pad Specimens on a Laboratory Size**
Jaesang Yoo, Youngze Lee (SungKyunKwan Univ.)

MNO-6
[P00225] **Sliding Friction Analysis and Real Contact Growth on Hierarchical Micro-Textured Surfaces**
Charchit Kumar (Université de Strasbourg)
Thomas Speck (Botanic Garden, Univ. of Freiburg)
Vincent Le Houérou (Université de Strasbourg)

Surfaces and Interfaces (SIO)

SIO-1
[P00083] **Effects of Dangling Bonds and Surface Energy on Tribological Properties of ta-CNx Coating in Unlubricated Condition**
Takaaki Miyachi (Nagoya Univ.)
Yuuya Nakashima (Fuji Electric Corporation)
Wooyoung Lee, Noritsugu Umehara, Takayuki Tokoroyama, Motoyuki Murashima (Nagoya Univ.)

SIO-2
[P00272] **Development of DLC Coating Surface Reforming Technology Using Dielectric Barrier Discharge**
Tomohiro Saso, Motoyuki Murashima, Noritsugu Umehara, Takayuki Tokoroyama, Wooyoung Lee (Nagoya Univ.)

SIO-3
[P00311] **Tribological Behaviour of Surface Textured Short Carbon Fibre Reinforced Nylon Composites Fabricated by 3D Printing Techniques**
Ming Luo, Ziyan Man, Siyu Huang, Hongjian Wang, Li Chang (The Univ. of Sydney)

SIO-4
[P00175] **Influence of Heat Treatment and Surface Condition on Early-Damaging of Rail Materials**
Andreas Trausmuth (AC^2T Research Gmbh)
R. Schmid (ÖBB-Infrastruktur AG)
M. Rodriguez Ripol, E. Badisch (AC^2T Research Gmbh)

SIO-5
[P00253] **CFD Analysis of Infinitely Wide Textured/Inclined Slider Bearing with a Groove**
Tae-Jo Park, In-Gyu Jang (Gyeongsang National Univ.)

Tribology of Machine Elements and Systems (TMO)

TMO-1
[P00109] **Development of Piston Ring Friction Measurement System**
Hyunjung Oh (Seoul National Univ.)
Kyoung-Pyo Ha (Hyundai Motor Group)
Kyoungdoug Min (Seoul National Univ.)

TMO-2
[P00156] **Feature of Acoustic Emission Signal in Tribological Phenomenon between Abrasive Grains and Glass**
Kouki Imai, Alan Hase (Saitama Institute of Technology)

TMO-3
[P00181] **Correlation Map Between Frequency Spectra of Acoustic Emission Signals and Tribological Phenomena**
Alan Hase (Saitama Institute of Technology)

TMO-4
[P00215] **Stacking Classifier Based Fault Detection in Spur Gear Train**
Vishwadeep Handikherkar, Vikas Phalle, Sangram Patil (Veermata Jijabai Technological Institute (VJTI) Mumbai)

TMO-5
[P00279] **Tribotronic Analysis of Internal Combustion Engine Compression Ring**
Konstantinos Tsatsoulis, Anastasios Zavos, Pantelis G. Nikolakopoulos (Univ. of Patras)

TMO-6
[P00280] **Investigation of the Compression Ring Sealing Behavior for Different Engine Conditions**
Anastasios Zavos, Pantelis G. Nikolakopoulos (Univ. of Patras)

TMO-7
[P00287] **Investigation of Bump-Type Gas Foil Bearings with Various Foil Materials**
Vishal Mourya, Skylab P. Bhore (Motilal Nehru National Institute of Technology Allahabad)

TMO-8
[P00290] **Analysis of Adhesion Force between a Connecting Rod Small-End and Its Bushing Assembled by an Interference Fit**
Jingwei Xiao, Wenjie Qin, Shangjie Xu (Beijing Institute of Technology)

TMO-9
[P00316] **Tilting Pad Journal Bearings with the Same Sommerfeld Number**
Junho Suh (Pusan National Univ.)
Sung-Hwa Jeung (Ingersoll Rand)
Sitae Kim (Korea Air Force Academy)

TMO-10
[P00146] **The Effects of Metal Surface Roughness on the Beginning Characteristic of Sliding Friction against Rubber Material under Oil Lubricated Condition**
Tomohiro Saso, Motoyuki Murashima, Noritsugu Umehara, Takayuki Tokoroyama (Nagoya Univ.)
Shoichiro Fuchi, Ryota Kanesaki, Ryo Okidate (Nihon Parkerizing Co.,Ltd.)

TMO-11
[P00210] **Numerical and Experimental Study on Influence of Different Operating Conditions on Wear Behaviour of Automotive Disc Brake Pad**
Vaibhav A. Kalhapure, H. P. Khairnar (Veermata Jijabai Technological Institute (VJTI))

TMO-12
[P00211] **Review on Machine Learning in Wear Estimation of Automotive Brake Lining**
H. P. Khairnar, Vaibhav A. Kalhapure, V. M. Phalle (Veermata Jijabai Technological Institute (VJTI))

TMO-13
[P00250] **Tilting Pad Journal Bearing Lubricated with Super Critical Carbon Dioxide (sCO2)- A Feasibility Study**
Syed Muntazir Mehdi, Tae Ho Kim (Kookmin Univ.)

TMO-14
[P00252] **Measurements of Drag Torque and Friction Coefficient of Gas Foil Thrust Bearings**
Sung Ho Hwang, Tae Ho Kim (Kookmin Univ.)

4. Poster Presentations

Coatings and Thin Films (CFP)

CFP-1
[P00030] **Investigation of Tribological Behavior of Metallic Thin Coating by Molecular Dynamics Simulation**
Kuk-Jin Seo, Dae-Eun Kim (Yonsei Univ.)

CFP-2
[P00073] **Friction and Wear of Carbon-Based Coatings at Low Temperatures**
Mahdi Khadem, Dae-Eun Kim (Yonsei Univ.)

CFP-3
[P00149] **Study on the Biotribological Properties of Carbon-Based Coatings**
Yuzhen Liu, Dae-Eun Kim (Yonsei Univ.)

CFP-4
[P00189] **Interaction of Accelerated C60 Ions with the Surface and Formation of Tribological Coatings and Structures**
Platon Karaseov (Peter the Great St.-Petersburg Polytechnic Univ.)
Vladimir Pukha (Institute of Problems of Chemical Physics of RAS)
Julia Popova (Lomonosov Moscow State Univ.)
Alexander Shakhmin, Andrei Titov (Peter the Great St.-Petersburg Polytechnic Univ.)

CFP-5
[P00201] **Investigation of Tribological Properties of DLC Coatings with respect to Engine Oil Lubricant**
Tae-Hyeong Kim (Yonsei Univ.)
Jihwan Yoon, Gwangyul Ko, Jongseong Kim (Dongwoo HST Co.)
Dae-Eun Kim (Yonsei Univ.)

CFP-6
[P00226] **A Study on 50 μm of Thickness and Hard Coatings of Tetrahedral Amorphous Carbon Deposited by Filtered Cathodic Vacuum Arc Plasma**
Young-Jun Jang (Korea Institute of Materials Science)
Jaeil Kim (Nagoya Univ.)
Jisoo Kim, Do Hyun Kim, Yong-Jin Kang, Byeong-Ju Park, Jongkuk Kim (Korea Institute of Materials Science)

CFP-7
[P00234] **Effects of Al-Si Coating Thickness on Friction and Wear in Hot Press Forming**
Min Ki Ji (Incheon National Univ.)
Hyunsung Son, Jinkeun Oh, Seongwoo Kim (POSCO)
Tea-Sung Jun (Incheon National Univ.)

CFP-8
[P00313] **Cost-Effective Fabrication of Durable Replication Stamp Based on Nanoparticle Reinforced UV-Curable Polymer**
Selim Park, Jingyu Kim, Wookbae Kim (Korea Polytechnic Univ.)

CFP-9
[P00166] **Synthesis of Nanocomposite Carbon Coatings on Titanium under Irradiated by Accelerated C60 Molecules**
Julya Popova (Lomonosov Moscow State Univ.)
Andrew Belmesov, Vladimir Pukha (Institute of Problems of Chemical Physics of RAS)

CFP-10
[P00182] **The Formation of Nano-Patterned Diamond-Like Coatings on Silicon and Titanium**
Andrey Belmesov, Nadezhda Dremova (Institute of Problems of Chemical Physics of Russian Academy of Sciences, IPCP RAS)
Igor Khodos (Institute of Microelectronic Technology and High Purity Materials, IMT RAS)
Evgeniy Kabachkov (Institute of Problems of Chemical Physics of Russian Academy of Sciences, IPCP RAS)

CFP-11
[P00184] **The Structure of Coatings Obtained by Co-Deposition of C60-Fullerene Molecules and Ions**
Grigory Nechaev, Vladimir Pukha (Institute of Problems of Chemical Physics RAS, IPCP RAS)
Igor Khodos (Institute of Microelectronic Technology and High Purity Materials, IMT RAS)
Rishat Gabdullin (Moscow State Univ.)

CFP-12
[P00242] **Biocompatibility and Tribological Properties of Sputtered Amorphous Carbon Coating**
Vishnu Shankar Dhandapani (Yonsei Univ.)
Ramesh Subbiah (Univ. of Science and Technology, UST)
Elangovan Thangavel (Periyar Univ.)
Chang-Lae Kim (Chosun Univ.)
Kyoung-Mo Kang (Yonsei Univ.)
Veeravazhuthi Veeraragavan (PSG College of Arts & Science)
Kwideok Park (Korean Institute of Science and Technology, KIST)
Dae-Eun Kim (Yonsei Univ.)

CFO-13
[P00317] **C60-Based Nanocarbon Systems to Reduce Friction and Wear**
Vladimir Pukha (Institute of Problems of Chemical Physics of RAS)
Igor Khodos (Institute of Microelectronics Technology and High Purity Materials, RAS)
Evgeny Kabachkov (Institute of Problems of Chemical Physics of RAS)
Platon Karaseov (Peter The Great St. Petersburg Polytechnic Univ.)

Contact Mechanics (CMP)

CMP-1
[P00141] **Analysis of Edge Slipping Distance in Adhesive Complete Contact**
Hyung-Kyu Kim, Young-Ho Lee (Korea Atomic Energy Research Institute)

CMP-2
[P00249] **A Study on Nonlinear Responses and Bifurcations of an Eccentric Rotor with Automatic Multi-Ball Balancer System**
Sang-Kyu An, Sitae Kim (Korea Air Force Academy)
Junho Suh (Pusan National Univ.)

CMP-3
[P00273] **Research on Elastoplastic Contact of Rough Surfaces Considering Wear**
Wei Li, Ping Huang (South China Univ. of Technology)

Fundamentals of Friction and Wear (FWP)

FWP-1
[P00292] **Friction and Wear Mechanisms of Cu/ta-C Coatings under PAO Oil**
Decelyne Elly Binjua (Universiti Malaysia Sabah)
Young-Jun Jang, Jong-Kuk Kim (Korean Institute of Material Science)
Seock-Sam Kim (Universiti Malaysia Sabah)

FWP-2
[P00293] **The Effect of Oxygen Plasma Treatment of ta-C Coating on Its Friction and Wear Properties**
Angel Sui Yee Hau (Universiti Malaysia Sabah)
Young-Jun Jang, Jong-Kuk Kim (Korean Institute of Material Science)
Seock-Sam Kim (Universiti Malaysia Sabah)

FWP-3
[P00301] **Tribological Characteristics of ABS-Like Resin According to Viscosity of Lubricant and Load Condition**
Seonghyun Park, Jungyu Son, Seongwoong Woo, Euijin Ryu, Hyunseop Lee (Tongmyong Univ.)

Lubrication (LUP)

LUP-1
[P00283] **Tribological Behaviour of Diamond Like Carbon Coated UIC60 Steel under Lubrication**
Nuratika Shaheera Rahama, Ch'ng Yoong Choeng (Universiti Malaysia Sabah)
Tae-Gyu Kim (Pusan National Univ.)
Seock-Sam Kim (Universiti Malaysia Sabah)

Micro/Nano-Tribology (MNP)

MNP-1
[P00197] **A Review of Micro/Nano-Tribology**
Chang-Lae Kim (Chosun Univ.)
Hae-Jin Kim (Gyeongsang National Univ.)
Hyun-Joon Kim (Kyungpook National Univ.)
Chang-Dong Yeo (Texas Tech Univ.)
Koo-Hyun Chung (Univ. of Ulsan)
In-Ha Sung (Hannam Univ.)

MNP-2
[P00246] **Adhesion Characteristics of Polymer Stamp for Micro-Device Transfer Process**
Min-Ah Yoon, Chan Kim, Jae-Hyun Kim (Univ. of Science and Technology, UST)
Kwang-Seop Kim (Korea Institute of Machinery and Materials, KIMM)

MNP-3
[P00150] **The Effect of Structure Parameters on the Wear Resistance of Aluminum, Copper and Alloys Based on Them**
Rafail Apakashev, Mark Khazin, Sergey Krasikov (Ural State Mining Univ.)

MNP-4
[P00171] **Nanoscale Frictional Effect of Water Layers Intercalated Between Exfoliated MoS_2 and Mica**
Dooho Lee, Hyunhwa Lee, Jeong Young Park (KAIST)

Surfaces and Interfaces (SIP)

SIP-1
[P00114] **Effect of Surface Treatment on the Property of Thin Film Coating on Polymer**
Jiwon Choi, Yuzhen Liu, Dae-Eun Kim (Yonsei Univ.)

SIP-2
[P00142] **Comparative Study on Fretting Wear Behaviors of CrAl Coatings Deposited by Arc Ion Plating and Sputtering Methods**
Young-Ho Lee, Jung-Hwan Park, Hyung-Kyu Kim, Hyun-Gil Kim (Korea Atomic Energy Research Institute)

SIP-3
[P00196] **Effect of Inner and Outer Conditioners on Pad Wear Profile in Two-Zone Conditioning System**
Jungyu Son, Seonghyun Park, Hyunseop Lee (Tongmyong Univ.)

SIP-4
[P00235] **Observation on the Generation Mechanism of the Within-Wafer Non-Uniformity (WIWNU) in Chemical Mechanical Planarization**
In-Ha Sung (Hannam Univ.)

SIP-5
[P00241] **Wettability Characteristics of Aluminum Surface with Curved Grooves**
Mu Yeon Jang, Tae Wan Kim (Pukyong National Univ.)

SIP-6
[P00259] **Effects of Ultrasonic Nanocrystal Surface Modification on Friction and Wear Behavior of a Ball Screw Made of AISI4150H Steel**
Jun-Suek Ro, Young-Sik Pyun, Auezhan Amanov (Sun Moon Univ.)

SIP-7
[P00314] **Wettability Control of Aluminum Alloy Using Industrial Anodizing Conditions**
Jingyu Kim (Korea Polytechnic Univ.)
Jaedong Eo (S&D ENG Co., Ltd)
Selim Par, Wookbae Kim (Korea Polytechnic Univ.)

Tribology of Machine Elements and Systems (TMP)

TMP-1
[P00163] **Effect of Retained Austenite on Fatigue Behavior under Oil Lubrication Condition**
Chanhyun Son, Sanhae Hwang, Sooun Kim, Minuk Kang, Jaeseong Lee, Daeyong Lee (Schaeffler Korea)

TMP-2
[P00240] **Critical Shoulder Height of Raceway in Ball Bearing Considering Elasto-Hydrodynamic Lubrication**
Tae Wan Kim (Pukyong National Univ.)

TMP-3
[P00244] **Optimization of Ultrasonic Resonant Frequency According to Micro-Leakage Location and Leak Rate in High Pressure Chamber**
Wonjun Seo, Seongjin Son, Seokyeon Im (Tongmyong Univ.)

TMP-4
[P00247] **Assessment of Stick-Slip Friction of Weather Strip Seals**
Ngoc-Phat Huynh, Koo-Hyun Chung (Univ. of Ulsan)

TMP-5
[P00264] **A Numerical Study on the Oxidizer Pump Rear Floating Ring Seal Performance for 7tonf Class Turbopump**
Joonhwan Bae, Hyunduck Kwak, Sungjae Heo, Soonsam Hong, Changho Choi (Korea Aerospace Research Institute)

TMP-6
[P00276] **Simulation Research on Lubricating Oil Flow in Connecting Rod Small End Bearing**
Chenglong Zhong, Jianhua Xiang (Beijing Institute of Technology)

TMP-7
[P00299] **Pressure Transmission System in Microgap Hybrid Journal Bearing**
Pengju Li, Zhengkai Zhang, Qingguo Wen (Xi'An Univ. of Architecture and Technology)

TMP-8
[P00155] **A Study on the Internal Flow of Lubricant in Deep Groove Ball Bearings**
Kangseok Kim, Kyoungku Lee, Daeyong Lee (Schaeffler Korea)
Deugwoo Lee (Pusan National Univ.)

TMP-9
[P00161] **A Study on Failure Types of Rolling Bearings for EV/HEV Application**
Minhwan Kim, Jinwoo Han, Chanhyun Son, Seungho Choi, Daeyong Lee (Schaeffler Korea)

5. Young Korean Researchers Agora (Oral/Poster Integrated Session)

Student Research & Design Exchange

SRD-1
[P00030] **Investigation of Tribological Behavior of Metallic Thin Coating by Molecular Dynamics Simulation**
Kuk-Jin Seo, Dae-Eun Kim (Yonsei Univ.)

SRD-2
[P00081] **Effect of Substrate on the Tribological Characteristics of Graphene Films**
Youjin Min, Kyeong-Hee Kang, Dae-Eun Kim (Yonsei Univ.)

SRD-3
[P00109] **Development of Piston Ring Friction Measurement System**
Hyunjung Oh (Seoul National Univ.)
Kyoung-Pyo Ha (Hyundai Motor Group)
Kyoungdoug Min (Seoul National Univ.)

SRD-4
[P00114] **Effect of Surface Treatment on the Property of Thin Film Coating on Polymer**
Jiwon Choi, Yuzhen Liu, Dae-Eun Kim (Yonsei Univ.)

SRD-5
[P00154] **Effect of Adhesion on a Beam with Surface Effects Lifted from the Ground**
Kyeongmin Kim, Yong Hoon Jang (Yonsei Univ.)

SRD-6
[P00190] **A Study of Elastohydrodynamic Lubrication for the Water-lubricated Composite Journal Bearing**
Wonvin Kim, Seong Su Kim (KAIST)

SRD-7
[P00196] **Effect of Inner and Outer Conditioners on Pad Wear Profile in Two-Zone Conditioning System**
Jungyu Son, Seonghyun Park, Hyunseop Lee (Tongmyong Univ.)

SRD-8
[P00201] **Investigation of Tribological Properties of DLC Coatings with respect to Engine Oil Lubricant**
Tae-Hyeong Kim (Yonsei Univ.)
Jihwan Yoon, Gwangyul Ko, Jongseong Kim (Dongwoo HST Co.)
Dae-Eun Kim (Yonsei Univ.)

SRD-9
[P00234] **Effects of Al-Si Coating Thickness on Friction and Wear in Hot Press Forming**
Min Ki Ji (Incheon National Univ.)
Hyunsung Son, Jinkeun Oh, Seongwoo Kim (POSCO)
Tea-Sung Jun (Incheon National Univ.)

SRD-10
[P00244] **Optimization of Ultrasonic Resonant Frequency According to Micro-Leakage Location and Leak Rate in High Pressure Chamber**
Wonjun Seo, Seongjin Son, Seokyeon Im (Tongmyong Univ.)

SRD-11
[P00246] **Adhesion Characteristics of Polymer Stamp for Micro-Device Transfer Process**
Min-Ah Yoon, Chan Kim, Jae-Hyun Kim (Univ. of Science and Technology, UST)
Kwang-Seop Kim (Korea Institute of Machinery and Materials, KIMM)

SRD-12
[P00248] **Enhancement of Surface Reliability of Marine Engine Components Using DLC Film**
Hyeseon Park (Univ. of Ulsan)
Hyang Lee, Sang Don Lee (Hyundai Heavy Industries Co., Ltd.)
Koo-Hyun Chung (Univ. of Ulsan)

SRD-13
[P00249] **A Study on Nonlinear Responses and Bifurcations of an Eccentric Rotor with Automatic Multi-Ball Balancer System**
Sang-Kyu An, Sitae Kim (Korea Air Force Academy)
Junho Suh (Pusan National Univ.)

SRD-14
[P00259] **Effects of Ultrasonic Nanocrystal Surface Modification on Friction and Wear Behavior of a Ball Screw Made of AISI4150H Steel**
Jun-Suek Ro, Young-Sik Pyun, Auezhan Amanov (Sun Moon Univ.)

SRD-15
[P00301] **Tribological Characteristics of ABS-Like Resin according to Viscosity of Lubricant and Load Conditions**
Seonghyun Park, Jungyu Son, Seongwoong Woo, Euijin Ryu, Hyunseop Lee (Tongmyong Univ.)

SRD-16
[P00313] **Cost-Effective Fabrication of Durable Replication Stamp Based on Nanoparticle Reinforced UV-Curable Polymer**
Selim Park, Jingyu Kim, Wookbae Kim (Korea Polytechnic Univ.)

SRD-17
[P00314] **Wettability Control of Aluminum Alloy Using Industrial Anodizing Conditions**
Jingyu Kim (Korea Polytechnic Univ.)
Jae Dong Eo (S&D ENG Co., Ltd)
Selim Park, Wookbae Kim (Korea Polytechnic Univ.)

SRD-18
[P00061] **Analysis of Spherical Tip Size Effect on Brittle-to-Ductile Transition in Brittle Materials**
Kwangmin Lee, Karuppasamy Pandian Marimuthu, Hyungyil Lee (Sogang Univ.)

SRD-19
[P00171] **Nanoscale Frictional Effect of Water Layers Intercalated Between Exfoliated MoS_2 and Mica**
Dooho Lee, Hyunhwa Lee, Jeong Young Park (KAIST)

SRD-20
[P00206] **Identification of Micro-particle Generation Mechanisms through Friction Tests of Brake Pad Specimens on a Laboratory Size**
Jaesang Yoo, Youngze Lee (SungKyunKwan Univ.)

SRD-21
[P00252] **Measurements of Drag Torque and Friction Coefficient of Gas Foil Thrust Bearings**
Sung Ho Hwang, Tae Ho Kim (Kookmin Univ.)

Young Professionals Festa

YPF-1
[P00197] **A Review of Micro/Nano-Tribology**
Chang-Lae Kim (Chosun Univ.)
Hae-Jin Kim (Gyeongsang National Univ.)
Hyun-Joon Kim (Kyungpook National Univ.)
Chang-Dong Yeo (Texas Tech Univ.)
Koo-Hyun Chung (Univ. of Ulsan)
In-Ha Sung (Hannam Univ.)

YPF-2
[P00223] **Estimation of Real Contact Spot Distribution Using Deep Learning**
Ilkwang Jang, Yong Hoon Jang (Yonsei Univ.)

YPF-3
[P00243] **Damage Mechanisms of CVD Graphene in Dry Transfer Process**
Chan Kim, Min-Ah Yoon (Univ. of Science and Technology, UST)
Bongkyun Jang, Jae-Hyun Kim (Korea Institute of Machinery and Materials, KIMM)
Hyun-Jun Jung (Center for Advanced Meta-Materials, CAMM)
Hak-Joo Lee, Kwang-Seop Kim (Korea Institute of Machinery and Materials, KIMM)

YPF-4
[P00264] **A Numerical Study on the Oxidizer Pump Rear Floating Ring Seal Performance for 7tonf Class Turbopump**
Joonhwan Bae, Hyunduck Kwak, Sungjae Heo, Soonsam Hong, Changho Choi (Korea Aerospace Research Institute)

YPF-5
[P00192] **Surface Termination-Dependent Nanotribological Properties of Single-Crystal MAPbBr3 Surfaces**
Joong Il Jake Choi (Institute for Basic Science, IBS)
Muhammad Ejaz Khan (KAIST)
Zafer Hawash (OIST)
Hyunhwa Lee (KAIST)
Luis Katsuya Ono, Yabing Qi (OIST)
Yong-Hoon Kim, Jeong Young Park (KAIST)

6. Lubricants Symposium

LUS-1
[P00297] **Gasoline Particulate Filters (GPFs): Insights Into Engine Lubricant Effects**
Yvonne Koay (Lubrizol)

LUS-2
[P00298] **Understanding Cooling Performance of Base Oils and New Test Development for Electric Drivetrain Fluids**
Yungwan Kwak, Christopher Cleveland, Kun Liu (Afton Chemical Corporation)

LUS-3
[P00294] **Understanding the Future of HD Lubricants**
Jinho Song (Infineum)

LUS-4
[P00295] **Mechanical Stability of Polymer-Modified Greases**
Erik Willett (Functional Products Inc.)

LUS-5
[P00312] **Development of High Efficiency Hydraulic Fluid for Excavator**
Daeho Kim, Hongsup Kwak, Wonho Lee, Seungbae Baek (Doosan Infracore)