

Proceedings of the 2018 Electrostatics Joint Conference

June 17-20, 2018

Boston University

[Technical Program](#)

Conference Chair: **Mark Horenstein**, Boston University

Technical Program Chair: **Shubho Banerjee**, Rhodes College

A. Atmospheric and Space Applications

A1. **Keynote Lecture:** Sow Mamadou, G. Dougniaux, S. Peillon, C. Grisolia, A. Autricque, P. Lemaitre, S. Bourrous, F. Gensdarmes, [Self-charging of radioactive dust and its bearing for nuclear safety.](#)

A2. **Invited Lecture:** Christine Hartzell, [Introduction to electrostatic dust motion on small planetary bodies.](#)

A3. Hashira Yamamoto, H. Yamamoto, T. Kuroki, H. Fujishima, M. Okubo, [Pilot-scale NO<sub>x</sub> and SO<sub>x</sub> aftertreatment using a two-phase ozone and chemical injection in glass-melting-furnace exhaust gas.](#)

A4. Carlos I. Calle , C. R. Buhler, M. D. Hogue, M. R. Johansen, P. J. Mackey, J. Phillips III, J.S. Clements, [Mitigation of electrostatic hazards in spacecraft.](#)

A5. Bing Guo, Wasim Javed, Ahmad Al-Kuwari, [Effect of voltage rise time on the efficiency of an electrodynamic dust shield device using trapezoidal waveform.](#)

A6. Annie A. R. Bernard Cristian Morales, Graham Silva, Ryan Eriksen, Mark N. Horenstein, Malay K. Mazumder, [How does sand get unipolar charge in an Electrodynamic Screen \(EDS\)?](#)

A7. Shubho Banerjee, Yi Song, Blake Wilkerson, [Electrostatics of unequal sized conducting spheres.](#)

B. Materials Processing and Behavior I

B1. **Invited Lecture:** Zachary Cordero, [Causes and consequences of powder bed charging in electron-beam additive manufacturing.](#)

B2. Frantisek Mach, [Crucial factors of plastic mixtures separation in free-fall electrostatic separator: simulation and experimental testing.](#)

B3. Keith Forward, [Heat and mass transport in the electrospinning process.](#)

B4. S. Touhami, Wessim Aksa, M. F. Boukhoulda, T. Zeghloul, K. Medles, Lucian Dascalescu, Amar Tilmatine, [Analysis of the trajectory of insulating particles in a free fall electrostatic separator equipped with four cylindrical electrodes.](#)

B5. Arash Sayyah, Martin Z. Bazant, Yi Jiang, [An experimental study on the electrostatic projection of particles in production of coated abrasive articles.](#)

B6. Michael Grinfeld, Pavel Grinfeld, [Towards the Kelvin formula of forces acting on polarized bodies.](#)

## C. Contact Charging and Triboelectric Effects I

- C1. **Bogdan-Marian Neagoe, Thami Zeghloul, Yopa Prawatya, Lucian Dascalescu**, [Analysis of electrically charged polymer surfaces effect on friction coefficient in lubricated sliding contacts.](#)
- C2. **Robert A. Morse**, [Teaching electrostatics in introductory physics: Real values and a really useful notation.](#)
- C3. **Daniel J. Breton, Emily Asenath-Smith, Nathan J. Lamie**, [Dynamic triboelectrification of gas-solids flows in metallic tubes.](#)
- C4. **Thiago A. L. Burgo , Bruno C. Batista, Fernando Galembeck**, [Elastoelectricity of elastomers: Mechanical-to-electrical energy conversion.](#)
- C5. **Adam L. Collins , Rhyan S. B. Ghosh, Seth J. Putterman**, [Triboelectrification of single crystals as a function of orientation and surface reconstruction.](#)
- C6. **Isaac Greber, Andrew Wang, John C. Angus**, [Charge transfer between chemically identical solids: Modeling and experimental studies.](#)
- C7. **Adriaan Riet, Mamadou Sow, Qizan Chen, Daniel J. Lacks**, [Modeling of coulombic adhesive forces on a charged particle near a grounded, conducting plane.](#)

## D. Contact Charging and Triboelectric Effects II

- D1. **Rhyan S. B. Ghosh , Adam L. Collins, Seth J. Putterman**, [Towards a single crystal triboelectric series.](#)
- D2. **Fahad Chowdhury, Manjil Ray, Andrew Sowinski, Poupak Mehrani, Alberto Passalacqua**, [A particle collision apparatus to study the magnitude and direction of charge transfer between two colliding particles](#)
- D3. **Gontran Richard, Ahlem Benabderrahmane, Karim Medles, Lucien Dascalescu, Thami Zeghloul**, [Influence of dielectric barrier discharge treatment on the triboelectric charging and the electrostatic separation of plastic particles.](#)
- D4. **Manjil Ray, Fahad Chowdhury, Andrew Sowinski, Poupak Mehrani, Alberto Passalacqua**, [Numerical modeling of electrostatic effects in monodisperse polyethylene particles in a bubbling fluidized bed.](#)
- D5. **Dylan Carter, Christine Hartzell**, [Measurements of granular tribocharging by high-speed videography.](#)
- D6. **Milad Taghavivand, Andrew Sowinski, Poupak Mehrani**, [Study of electrostatic charge generation of powders during pneumatic conveying.](#)

## E. Electrically-Induced Flows and Electrokinetics I

- E1. **Keynote Lecture: Christophe Louste**, [Fundamentals and applications for electrohydrodynamics.](#)
- E2. **Chaoao Shi, Kazimierz Adamiak and G. S. Peter Castle**, [Numerical study of the extended DBD for flow control.](#)
- E3. **Masaaki Okubo**, [Fluid dynamic analysis of electrostatic precipitators and ionized flows.](#)
- E4. **Juan-Martin Cabaleiro, Thierry Paillat, Guillermo Artana, Gerard Touchard**, [Flow electrification in turbulent flows of liquids - Comparison of two models.](#)
- E5. **Masahito Nishikawara, Ryo Yoneda, Hideki Yanada, Takeshi Miyakita, Kenichiro Sawada**, [Temperature dependence of the characteristics of an electrohydrodynamic pump with plate-bar electrodes.](#)

E6. **Maciej A. Noras, Wesley B. Williams**, [Modeling turbulent injection of electrically charged dielectric droplets.](#)

E7. **Michal Talmor, Christophe Louste, Jamal Seyed-Yagoob**, [PIV flow field measurements of electro-hydrodynamic conduction pumping.](#)

#### F. Electrically-Induced Flows and Electrokinetics II

F1. **Vladimir Chirkov, Aleksandr Lashko, Marina Reznikova, Albert Gazaryan**, [Numerical and experimental investigation of water droplet electrical coalescence and non-coalescence.](#)

F2. **Po-Hao Wang, Tsrong-Yi Wen**, [Experimental study of pressure and flow rate of wire-to-rod ionic wind pumps.](#)

F3. **Eric Moreau, Patrick Braud, Etienne Defoort, Nicolas Benard**, [EHD flow produced by positive and negative point-to-plate corona discharges.](#)

F4. **Ayyoub Zouaghi, Nouredine Zouzou, Lucian Dascalescu**, [Analysis of fine dielectric particles behavior in a traveling wave electric field.](#)

F5. **Aaron Griffin, Adam Henson, Michael S. June**, [Design of experiments to optimize geometric parameters for an electro-hydrodynamic air moving device.](#)

F6. **Albert Gazaryan, Vladimir Chirkov**, [Numerical and experimental investigation of flow-type electrohydrodynamic mixer.](#)

#### G. Biological and Medical Applications I

G1. **W. Balachandran**, [Potential of emerging electrostatic technologies for bio-medical and environmental applications.](#)

G2. **J. Kristof, H. Miyamoto, M. Blajan, K. Shimizu**, [Effect of plasma on structure and permeability of epidermal layer of pig skin.](#)

G3. **Elisabetta Sieni, Paolo Sgarbossa, Fabrizio Dughiero, Michele Forzan, Paolo Di Barba, Maria Evelina Mognaschi, Tejasvi Parupudi, Lakshya Mittal, Ignacio G. Camarillo, Raji Sundararajan**, [Effect of tissue inhomogeneity on Electric field intensity for electrochemotherapy treatment.](#)

G4. **Panik Moradian, Bianca Cruz, Nina Abramzon, Keith M. Forward**, [Surface adhesion effects of PMMA \(Poly\(methyl methacrylate\)\) of medical grade UHMWPE \(Ultra-High Molecular Weight Polyethylene\) after cold plasma treatment.](#)

G5. **Tejasvi Parupudi, Allen L. Garner, Raji Sundararajan**, [Electrical impedance as a biomarker for brain tumors.](#)

G6. **Suramya Mihindukulasuriya, Shesha Jayaram**, [Release of electrode materials during the processing of liquid foods using in pulse electric field treatment.](#)

#### H. Biological and Medical Applications II

H1. **Mochen Li, Raji Sundararajan**, [Application of machine learning algorithms on breast cancer dataset.](#)

H2. **Raji Sundararajan, Lakshya Mittal, Vishak Raman, V. Gowri Sree, S. Hemalatha, R. Rajaprabu, Arutselvan Natarajan, Ignacio G. Camarillo**, [Turmeric herbal electro-chemo-therapy for metastatic triple negative breast cancer.](#)

## I. Breakdown Phenomena and Discharges

- I1. **Manuel Martinez-Sanchez, Carmen Guerra-Garcia, Ngoc Cuong Nguyen, Jaime Peraire**, [Minimal model of a positive glow corona and its transition to streamers.](#)
- I2. **Deepthi Antony, G. S. Punekar, N. K. Kishore**, [Improvements in an iterative method for localization of Partial discharge source in oil insulation.](#)
- I3. **Pengfei Xu, Bo Zhang, Jinliang He, Shuiming Chen**, [Dynamic corona characteristics of falling water droplet on a conductor-to-ground electrode with AC voltage applied.](#)
- I4. **Gaohui He, Qin Hu, Lichun Shu, Xingliang Jiang, Dauchuan Yang, Raji Sundararajan**, [Influence of rime ice severity on conductor audible noise characteristics of positive corona discharge.](#)

## J. Gas Discharges and Microplasmas

- J1. **Keynote Lecture: Hak-Joon Kim, Yong-Jin Kim, Chang-Gyu Woo, Bangwoo Han**, [Novel air cleaning technologies for indoor air quality using electrostatic precipitation with near-zero ozone generation.](#)
- J2. **Tomoya Mitsui, Akinori Zukeran, Koji Yasumoto, Takashi Nakano, Koyu Tsubouchi, Takashi Ogawa**, [Prevention of back corona discharge in an electrostatic precipitator using asymmetrical rectangular AC voltage.](#)
- J3. **Takuya Kuwahara, Keiichiro Yoshida, Tomoyuki Kuroki, Kenichi Hanamoto, Kazutoshi Sato, Masaaki Okubo**, [Pilot-scale combined reduction of accumulated particulate matter and NO<sub>x</sub> using nonthermal plasma for marine diesel engine.](#)
- J4. **Daniel Martin, Nazli Turan, Paul Rumbach, David B. Go**, [Measuring the radius of the plasma at the plasma-liquid interface in a pulsed-current, DC discharge.](#)
- J5. **Tomoyuki Kuroki, Manabu Nakamura, Keita Hori, Masaaki Okubo**, [Effect of monomer concentration on adhesive strength of PTFE film in atmospheric plasma graft-polymerization process.](#)
- J6. **Takashi Ikehata, Ruida Bao, Tomotaka Kijima, Naoyuki Sato**, [Static elimination of charged objects in vacuum by pulsed glow plasma.](#)
- J7. **Yoshio Higashiyama, Takuya Nakajima, Toshiyuki Sugimoto**, [Decay time of current pulse by disruption of Taylor-cone formed at a capillary electrode under DC field.](#)

## K. Measurements and Instrumentation

- K1. **Kazuki Numayama, Toshiyuki Sugimoto, Koichi Taguchi**, [Non-contact surface resistivity tester for materials from 10<sup>6</sup> to 10<sup>11</sup> Ω.](#)
- K2. **Philippe Molinié**, [Return voltage as a dielectric characterization tool.](#)
- K3. **Haskar Houari, Miloua Farid, Oualid Imene, Ouari Abbes, Tilmatine Amar**, [High-voltage control of an electrostatic precipitator by automatic motorized potentiometer \(Amp\). In-situ measurement of the surface potential of the pollution layer.](#)

## L. Materials Processing and Behavior II

- L1. **Arathi Mohan Sharma, Faisal Aldawsari, Chitral Angamma, Shesha Jayaram**, [Filler dispersion and its influence on the performance of Nanocomposite materials.](#)
- L2. **Carson Gattenby, Sebastian Olarte, DaJohn Murray, Keith M. Forward**, [Electrospun polyvinylidene fluoride membranes for direct contact membrane distillation.](#)
- L3. **Michael Gevelber, Yunshen Cai**, [Analysis of electrospinning bending region physics in determining fiber diameter: Focus on mass transfer and effect of relative humidity for non-aqueous hydrophilic solutions.](#)

#### M. Safety and Hazards

- M1. **Keynote Lecture: Atsushi Ohsawa**, [Unified expressions of the charges transferred by brush discharges and of the onset criterion of propagating brush discharges on charged insulating coats and liners.](#)
- M2. **Keiichiro Yoshida**, [Aftertreatment of carbon particle emitted by diesel engine using combination of corona and dielectric barrier discharge.](#)
- M3. **N. K. Kishore, Harimurugan D., G. S. Punekar**, [Arrangement of conductors in a 220 kV double circuit line to reduce e-fields in view of public exposure.](#)
- M4. **D. Harimurugan, G. S. Punekar, N. K. Kishore**, [Electric field and exposure time in a EHV substation near a bay-equipment: concerning ICNIRP guidelines.](#)
- M5. **Takashi Miura**, [A study of the tribo-electrification reduction efficiency of argon-nitrogen mixtures due to micro-gap discharge at atmospheric pressure.](#)
- M6. **Ted Dangelmayer**, [Presentation/demonstration: ESD field measurement pitfalls; Voltage suppression.](#)
- M7. **Kelly Robinson**, [Recommended revisions for NFPA 77 recommended practice on static electricity.](#)

#### P. Poster Session and Demonstrations

- P1. **Sara Mantach, Kazimierz Adamiak**, [A full EHD flow pattern in point-plane corona discharge.](#)
- P2. **Maria Kezhia D. Rullan, Erik Jensen, Keith M. Forward**, [Humidity effects on triboelectrification of insulating materials.](#)
- P3. **Ahlem Benabderrahmane, Thami Zegloul, Gontran Richard, Karim Medles, Amar Tilmatine, Lucian Dascalescu**, [Factors influencing tribo-electrification of granular polymers in a coaxial-counter-rotating-cylinders tribo-charger.](#)
- P4. **Karim Medles, I. Achouri, T. Zegloul, K. Medles, H. Nouri, L. Dascalescu**, [Optimal operating point a tribo aero-electrostatic separator with rotating disk electrodes.](#)
- P5. **M. Maammar, Wessim Aksa, M. F. Boukhoulda, S. Touhami, L. Dascalescu, T. Zegloul**, [Numerical simulation of particle trajectories in a multifunctional electrostatic separator.](#)
- P6. **Akihiro Matsumura, Tatsushi Matsuyama, Kenta Kato, Junich Ida**, [Electrostatic charging of powder in a metal shaker.](#)
- P7. **Y. Kisanuki, K. Fukuda, Y. Makishima, K. Kitabayashi, S. Katsushima, N. Debasher, K. Takashima, A. Mizuno**, [Corona discharge with bundle of very fine conductive fibers.](#)
- P8. **Michelle Nassar, Christophe Louste, Anny Michel, Michel Daaboul**, [Experimental investigation of the variation of HFE electric properties with temperature.](#)
- P9. **A. K. Batra, B. B. Bohara, J. Mills**, [Mechanisms of DC and AC conduction in PLZT/paint](#)

[nanocomposite films.](#)

P10. **W. Mike Arnold**, [Microbial Disinfection using microplasma-generated ozone.](#)

P11. **Ouari Abbes, Miloua Farid, Oualid Imene, Djillali Auimeur, Haskar Houari, Tilmatine Amar**, [Monitoring of a bag filter by online measurement of the electrical charge of the filter media.](#)

P12. **Oualid Imène, Miloua Farid, Ouari Abbès, Flazi Samir**, [Contribution to the development and technology of electrostatic precipitator.](#)

P13. **Francisco J. Durán-Olivencia, Jamal S. Yagoobi**, [The effect of substrate curvature on flexible EHD conduction pumping performance: A numerical study.](#)

P14. **Olivia Koonce, Nicholas Drane, Michael S. June**, [3-D Printed, carbon filled-plastic electrode performance for an electro-hydrodynamic air moving device.](#)

P15. **Faisal Aldawsari, Arathi Mohan Sharma, Chitral Angamma, Shesha Jayaram**, [Investigation of polymer filler interface using dielectric spectroscopy.](#)

P16. **T. Jeya Shree, V. Gowri Sree, A. Priyanka, Raji Sundararajan, T. M. Sridhar**, [Polyphenol grape extract using pulsed electric field for cancer treatment.](#)

P17. **Myungjoon Kim, Yong-Jin Kim, Bangwoo Han, Chang Gyu Woo, Hak-Joon Kim**, [Fine particle removal from a corrosive gas using a two-stage electrostatic precipitator with multiple ion injection type chargers and parallel collection plates.](#)

P18. **Aditya Bandopadhyay, N. K. Kishore, Suman Chakraborty**, [Experimental observation of lateral movement of a sedimenting drop due to a tilted electric field.](#)

P19. **Michael Johansen, J. R. Phillips III, J. J. Wang, J. Mulligan, J. S. Clements, C. I. Calle**, [Electrical characteristics of the mars electrostatic precipitator.](#)

P20. **Marius Blajan, Daisuke Nonanka, Jaroslav Kristof, Kazuo Shimizu**, [Influence of the microplasma actuator electrode configuration on the Induced EHD flow.](#)

P21. **Satish Polisetty, Shesha Jayaram, Ayman El-Hag**, [Classification of different types of discharges in insulation system using acoustic signals.](#)

P22. **Thiago A. L. Burgo, Kelly S. Moreira, Leticia O. Ferreira, Fernando Galembeck**, [Spontaneous electrostatic charging during evaporation at solid-liquid and solid-gas interfaces.](#)

P23. **Mark Horenstein**, [Design of an ultra-sensitive electric-field sensor using digital signal processing.](#)

P24. **Liangliang Li, Baoquan Liu, Xin Gao, Quanzhen Liu**, [Study on electrostatic hazard and prevention in Polyester granules packing process.](#)

P25. **Cuong Nguyen, Carmen Guerra Garcia, Manuel Martinez-Sanchez, Jaime Peraire**, [Simulation of glow corona discharge on airfoils.](#)