Naohiro Hozumi

Professor Emeritus
Toyohashi University of Technology

Education :
Bachelor degree: Waseda University, 1981
Master degree: Waseda University, 1983
Ph.D. degree: Waseda University, 1990

Employment :
Central Research Institute of Electric Power Industry (CRIEPI) from 1983 to 1999
Associate professor of Toyohashi University of Technology from 1999 to 2006.
Professor of Aichi Institute of Technology from 2006 to 2011.
Professor of Toyohashi University of Technology since 2011.
Professor Emeritus of Toyohashi University of Technology since 2023.

Research areas :
Engaged in the research in insulating materials and diagnosis for high voltage equipment, acoustic measurement for biological and medical applications, etc.

Awards :
IEE of Japan for outstanding research papers in 1990, 1999 and 2019.
IEE of Japan (DEI committee) Ieda Memorial Award in 2018.

Short curriculum vitae:

Naohiro Hozumi was born in Kyoto, Japan on April 2, 1957. He received his B.S., M.S. and Ph.D. degrees in 1981, 1983 and 1990 from Waseda University, Japan. He was engaged in Central Research Institute of Electric Power Industry (CRIEPI), Japan from 1983 to 1999. He was an associate professor of Toyohashi University of Technology, Japan from 1999 to 2006, and a professor of Aichi Institute of Technology, Japan from 2006 to 2011. Since 2011, he has been a professor of Toyohashi University of Technology, where he has been a head of Department of Electrical & Electronic Information Engineering in his university since 2020. He is currently an Emeritus Professor of Toyohashi University of Technology.

He was a visiting researcher of Connecticut University, USA from 1988 to 1989, National Key Laboratory of Xi'an Jiaotong University, China in 2000, Paul Sabatier University, France in 2003. He has been a Research Professor of Center for Medical Engineering, Chiba University, Japan since 2018.

He was a chair of Technical Committee of Dielectrics and Insulating Materials in IEEJ from 2006 to 2010, chair of Japan National Committee of CIGRE SC D1 (Materials and Emerging Test Techniques) from 2010 to 2015. He has been a chair of Technical Committee of Electrical Wire and Cables since 2018, and a chair of IEEE DEIS Japan Chapter since 2021.

He has been engaged in the research in insulating materials and diagnosis for high voltage equipment, acoustic measurement for biological and medical applications, etc. He was awarded in 1990, 1999 and 2019 from IEE of Japan for his outstanding research papers, and awarded with the IEE of Japan (DEI committee) Ieda Memorial Award in 2018, and with the IEEE International Conference on Electrical Materials and Power Equipment (ICEMPE) Jidan Chen Award in 2023. He is a member of IEEE, CIGRE, IEE of Japan and the Acoustic Society of Japan.

Major Papers:

(1) Electrical treeing and insulation performances

1. N. Hozumi, T. Okamoto, H. Fukagawa: "Simultaneous Measurement of Microscopic Image and Discharge Pulses at the Moment of Electrical Tree Initiation", Jpn. J. Appl. Phys., Vol.27, No.4, pp.572-576 (1988).
2. T. Okamoto, N. Hozumi, M. Ishida: "Effects of Agglomeration of Carbon Particles in the Semiconducting Material on the Dielectric Strength of XLPE Insulation", IEEE Trans on Electr. Insul., Vol.23, No.3, pp.335-344 (1988).
3. N. Hozumi, T. Okamoto, H. Fukagawa: "TEM Observation of Electrical Tree Paths and Microstructures in Polyethylene", Jpn. J. Appl. Phys., Vol.27, No.7, pp.1230-1233 (1988).
4. T. Okamoto, M. Ishida, N. Hozumi: "Dielectric Breakdown Strength Affected by the Lamellar Configuration in XLPE Insulation at a Semiconducting Interface", IEEE Trans on Electr. Insul., Vol.24, No.4, pp.599-607 (1989).
5. N. Hozumi, J. Tanaka, A. S. DeReggi, N. Nagusurinivas: "Space Charge Induced in Stresses Polyethylene", Proc. Conf. Electr. Insul., Dielectr. Phenomenon (CEIDP), #5-6 pp.253-258, Knoxville, USA (1989).
6. N. Hozumi, M. Ishida, T. Okamoto, H. Fukagawa: "The Influence of Morphology on Electrical Tree Initiation in Polyethylene under ac and Impulse Voltages", IEEE Trans on Electr. Insul., Vol.25, No.4, pp.707-714 (1990).
7. T. Tanaka, T. Okamoto, N. Hozumi, H. Suzuki: "Interfacial Improvement of XLPE Cable Insulation at Reduced Thickness", IEEE Trans on Dielectr. & Electr. Insul., Vol.3, No.3, pp.345-350 (1996).
8. R. Kurnianto, Y. Murakami, N. Hozumi, M. Nagao: "Treeing Breakdown in Inorganic-filler/LDPE Nano-composite Material", Trans. IEE Japan, Vol.127-A, No.1 pp.29-34 (2006).
9. R. Kurnianto, Y. Murakami, N. Hozumi, M. Nagao: "Characterization of Tree Growth in Filled Epoxy Resin: The Effect of Filler and Moisture Contents", IEEE Trans on Electr. Insul., Vol.14, No.2, pp.427-435 (2007).
10. R. Kurnianto, Y. Murakami, M. Nagao, N. Hozumi: "Investigation of Filler Effect on Treeing Phenomenon in Epoxy Resin under ac Voltage", IEEE Trans on Dielectr. & Electr. Insul., Vol.15, No.4, pp.1112-1119 (2008).
11. JH. Lee, TS. Kong, SJ. Kim, KH. Kwon, K. Cho, N. Hozumi: "Temperature Dependence of Conductivities of Recyclable Polyethylene and Polypropylene and its Effects on Electric Field Distribution in Power Cable", Trans. Korean IEE, Vol. 60, No. 10, pp. 1881-1887(2011).
12. T. Kawashima, Yup Pui San, Y. Murakami, N. Hozumi, M. Nagao, “Effects of Partial Discharge on DC Breakdown Characteristics of Paper-Ice Composite Insulation System in Liquid Nitrogen”, Proc. Conf. Electr. Insul., Dielectr. Phenomenon (CEIDP), Toronto, Canada, pp.235-238 (2016).
13. T. Kawashima, H. Takahagi, R. Kubota, Y. Murakami, N. Hozumi, M. Nagao, “Influence of Surface Charge on Insulating Sheet on Partial Discharge Inception Voltage”, 2017 Int. Symp. on Electrical Insulating Materials (ISEIM), Aichi, Japan, DM-5, p.792 (2017).
14. Nhet Ra, Nur Sabihah Binti Mustafa, H. Futami, T. Kawashima, Y. Murakami, N. Hozumi, T. Takahashi, “Development of The New Partial Discharge Measuring Method and Device for Long Power Cable using Foil Electrode”, 2017 Int. Symp. on Electrical Insulating Materials (ISEIM), Aichi, Japan, P1-12, pp.347-350 (2017).
15. T. Kawashima, H. Takahagi, R. Kubota, Y. Murakami, N. Hozumi, M. Nagao, “Partial Discharge Inception Voltage under Positive Surge Voltage Application Influenced by Surface Charge on Polyimide Film”, 2017 Int. Symp. on Electrical Insulating Materials (ISEIM), Aichi, Japan, SPD3, pp.163-166 (2017).
16. H. Takahagi, T. Kawashima, N. Hozumi, Y. Murakami, “Spark Discharge Inception Voltage under Surge Voltage Application Influenced by Air Gap Length”, Proc. Conf. Electr. Insul., Dielectr. Phenomenon (CEIDP), Fort Worth, USA, pp.525-528 (2017).
17. S. Abe, T. Kawashima, M. Nagao, N. Hozumi, Y. Murakami, N. Miyakawa, H. Shiota, T.

Tsurimoto, “Electrical Treeing Characteristics near Multi-layer Interface”, Proc. Conf. Electr. Insul., Dielectr. Phenomenon (CEIDP), Fort Worth, USA, pp.741-744 (2017).
18. D. Yamada, D. Isshiki, T. Kawashima, N. Hozumi, Y. Murakami, “Influence of Silica Filler Particle Size in Epoxy Resins on the Electrical Treeing Characteristic”, Proc. Conf. Electr. Insul., Dielectr. Phenomenon (CEIDP), Cancun, Mexico, pp. 334-337 (2018).
19. N. Kodama, D. Yamada, T. Kawashima, N. Hozumi, Y. Murakami, S. Yoshida, T. Umemoto, T. Mabuchi, H. Muto, “Treeing Breakdown Property in Epoxy/TiO_2 Nanocomposites”, Proc. Conf. Electr. Insul., Dielectr. Phenomenon (CEIDP), Richland, USA, pp. 123-126 (2019).
20. N. Hamasaki, S. Yamaguchi, S. Use, T. Kawashima, H Muto, M. Nagao, N Hozumi, Y. Murakami, “Electrical and Thermal Properties of PMMA/h-BN Composite Material Produced by Electrostatic Adsorption Method”, IEEJ Transaction on Electrical and Electronic Engineering, Vol. 139, No. 2, pp. 60-65 (2019).
21. T. Kawashima, Totoh Abdul Matin, Y. Murakami, N. Hozumi, S. Yoshida, T. Umemoto, T. Mabuchi, H. Muto, “Fundamental Study for Quantification of Change in PD Waveform on Electrical Treeing”, Proc. Conf. Electr. Insul., Dielectr. Phenomenon (CEIDP), Richland, USA, pp. 418-421 (2019).
22. N. Takeda, T. Kawashima, Y. Murakami, N. Hozumi, “Assessment of Charge Behavior in Electrical Tree Tube Based on Characteristics of Partial Discharge Waveform”, 2020 Int. Symp. on Electrical Insulating Materials (ISEIM), Tokyo, Japan, VL-4, pp.572-575 (2020).
23. Y. Murakami, D. Yamada, N. Kodama, T. Kawashima, N. Hozumi, S. Yoshida, T. Umemoto, T. Mabuchi, H. Muto: "Electrical Treeing Breakdown Characteristics of Epoxy/TiO_2 Nanocomposites Influenced by Aggregates of Nano-Sized TiO_2", IEEJ Transactions on Electrical and Electronic Engineering, Vol. 17, No. 3 pp. 486-492 (2021).
24. Y. Murakami, T. Noda, T. Kawashima, N. Hozumi: "Electrical Treeing Breakdown Characteristics of Epoxy/Spherical Boron Nitride with Card-House Structure Composites", IEEJ Transactions on Electrical and Electronic Engineering, Vol. 17, No. 2, pp. 169-173 (2022).

(2) Partial discharge and insulation performances
25. N. Hozumi, T. Okamoto, T. Imajo: "Discrimination of Partial Discharge Patterns Using a Neural Network", IEEE Trans on Electr. Insul., Vol.27, pp.550-556 (1992).
26. JH. Lee, N. Hozumi, T. Okamoto: "A New Standardization Method for PD Pattern Recognition Using Neural Network", J. of Korean Inst. Electr. Engineers, Vol.8, No.1, pp.34-41 (1995).
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29. Totoh Abdul Matin, T. Kawashima, Y. Murakami, N. Hozumi, Suwarno, “Observation of Partial Discharge Waveform of Electrical Treeing in Epoxy Resin with Filler”, 2019 2nd International Conference on High Voltage Engineering and Power Systems, Denpasar, Indonesia, pp.208-221 (2019).
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31. K. Yamada, T. Kawashima, T. Obana, Y. Murakami, M. Nagao, N. Hozumi, “Assessment of Electrical Insulation Performance of Cryogenic Fluids Using Partial Discharge Waveform”, The 28th International Toki Conference on Plasma and Fusion Research, Gifu, Japan, P2-73, 1 page (2019).
32. K. Yamada, T. Kawashima, Y. Murakami, N. Hozumi, “Effect of solid nitrogen particles on partial discharge characteristics in slush nitrogen”, Proc. Conf. Electr. Insul., Dielectr. Phenomenon (CEIDP), East Rutherford, USA, pp.173-176 (2020).
33. N. Takeda, T. Kawashima, M. Kurimoto, Y. Murakami, N. Hozumi, S. Yoshida, T. Umemoto, T. Mabuchi, H. Muto, “Assessment of Charge Behavior in Electrical Tree of Composite

Material Based on Characteristics of PD Waveform", Proc. Conf. Electr. Insul., Dielectr. Phenomenon (CEIDP), USA, pp.334-337 (2020).
34. K. Yamada, T. Kawashima, T. Obana, Y. Murakami, M. Nagao, N. Hozumi, "Discrimination of Partial Discharges in Gaseous and Liquid Nitrogen by UsingWaveform Characteristics", Plasma and Fusion Research, Vol. 15, 2401025-1 - 2401025-4 (2020).
35. Q. Ho, T. Kawashima, Y. Murakami, N. Hozumi: "Fundamental Study on Condition Assessment of Insulating Material Using Deep Learning Based on Waveform Characteristics of Partial Discharge", Proc. 2022 Int'l. Conf. Conditioning Monitoring and Diagnoses, C2-7, pp. 241-244.

(3) Space charge measurement and insulation performances

36. N. Hozumi, H. Suzuki, T. Okamoto, K. Watanabe, A. Watanabe: "Direct Observation of Time-dependent Space Charge Profiles in XLPE Cable under High Electric Fields", IEEE Trans on Dielectr. & Electr. Insul., Vol.1, No.6, pp.1068-1076 (1994).
37. T. Takeda, N. Hozumi, H. Suzuki, T. Okamoto, K. Watanabe, A. Watanabe: "Space Charge Measurement in XLPE Cable with 9 mm-thick Insulation", Revue de l'electricite et de l'electronique, Special cables, Vol.1, pp.26-33 (1996).
38. N. Hozumi, T. Takeda, H. Suzuki, T. Okamoto: "Space Charge Behavior in XLPE Cable Insulation under 0.2-1.2MV/cm dc Fields", IEEE Trans on Dielectr. & Electr. Insul., Vol.5, No.1, pp.82-90 (1998).
39. C. R. Lee, T. Takeda, N. Hozumi, H. Suzuki, T. Okamoto: "Electrical Breakdown Strength and Space Charge Distribution of Acrylic Acid-Graft-Polyethylene", Trans. IEE Japan, Vol.120-A, No.5, pp.589-594 (2000)
40. R. Kurnianto, Y. Murakami, N. Hozumi, M. Nagao: "Treeing Breakdown in Inorganic-filler/LDPE Nano-composite Material", Trans. IEE Japan, Vol.127-A, No.1 pp.29-34 (2006).
41. N.Hozumi, G.Teyssedre, C.Laurent, K.Fukunaga: "Behavior of Space Charge Correlated with Electroluminescence in Cross-linked Polyethylene", J of Physics D; Applied Physics, Vol.37, pp.1-7 (2004).
42. Y. Murakami, N. Hozumi, M. Nagao: "Surface Temperature Measurement and Analysis of Thermal Breakdown with Ethylene-vinyleacetate Copolymer in Room Temperature Region", Jpn J. Appl. Physics, Vol.43, No.9A, pp.6184-6187 (2004).
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44. G. Mazzanti, G. Chen, J. Fothergill, N. Hozumi, J. Li, M. Marzinotto, P. Morshuis, F. Mauseth, C. Reed, A. Tzimas, K. Wu: "A Protocol for Space Charge Measurements in Full-size HVDC Extruded Cables", IEEE Transactions on Dielectrics and Electrical Insulation, Vol. 22, No.1, pp. 21-34 (2014).
45. N. Hozumi, M. Hori: "Space Charge Measurement for Full-scale HVDC Cables Using Pulsed-electroacoustic Method", CIGRE SC D1 Rio de Janeiro Colloquium, #37 (2015).
46. Y. Murakami, T. Kawashima, N. Hozumi, M. Nagao, M. Fukuma, "Effect of Interfacial Condition between Film and Earthed Electrode on Space Charge Measurement", Sensors and Materials, Vol.29, No.8, pp.1191-1198 (2017).
47. Trinurkalid Sumarwoto, S. Morita, T. Kawashima, N. Hozumi, Suwarno, "Conductor Temperature Estimation in Full Size Cable by PEA Method", 2018 Conference on Power Engineering and Renewable Energy, Solo, Indonesia, 4 pages (2018).
48. N. Hozumi, E. B. Prastika, S. Zahra, T. Kawashima and Y. Murakami: "Dual-domain Deconvolution Process Applied to Time-resolved Quantitative Dielectric Measurement," 2020 IEEE 3rd International Conference on Dielectrics (ICD), 2020, pp. 347-350 (2020).
49. X Li, Shafira Zahra, T. Kawashima, Y. Murakami, N. Hozumi: "Lock-in Calibration for Space Charge Measurement", Proc. 2020 IEEE 3rd International Conference on Dielectrics (ICD), pp. 391-395 (2020).
50. Shafira Zahra, T. Kawashima, Y. Murakami and N. Hozumi: "Small-size Space Charge Measurement Device for Power Cables by Using Electrically Insulated Acoustic Coupler", Proc.

2020 IEEE 3rd International Conference on Dielectrics (ICD), pp. 359-362 (2020).
51. E. B. Prastika, S. Zahra, X Li, Y. Murakami, T. Kawashima, N. Hozumi, YH Kim: "The Application of Signal Processing Using Dual Domain Deconvolution for New Space Charge Measurement Method in HVDC Full-Size Cables", Proc. 2020 Int'l Symp. Electr. Insul. Materials, pp. 277-280 (2020).
52. S. Morita, N. Fuse, T. Takahashi, T. Takahashi and N. Hozumi: "Evaluation of Noise and DC Offset Voltage on Signal Processing for Space Charge Measurement of HVDC Cables," 2020 Int. Symp. on Electrical Insulating Materials (ISEIM), pp. 139-142 (2020).
53. T. Matsui, K. Tatsumi, T. Kawashima, Y. Murakami, N. Hozumi, and T. Matsumoto, “Frequency determination in nondestructive test of semiconductor devices with ultrasound heating”, Jpn. J. Appl. Phys. 59 [SK], SKKB07, 8 pages (2020).
54. O.Masui, Y. Itakura, T. Kawashima, N. Hozumi, Y. Murakami, “Space Charge Characteristics of Slide-ring Materials under Various Voltage Applications” Proc. Conf. Electr. Insul., Dielectr. Phenomenon (CEIDP), East Rutherford, USA, pp.108-111 (2020).
55. S. Morita, N. Fuse, T. Takahashi, T. Matsubara, Y. Murata S. Zahra, N. Hozumi: “Space Charge Measurement of Full-size 23-mm-thick XLPE Cables in Load Cycle Condition”, Proc. JICABLE HVDC’21 (2021).
56. X. Li, T. Kawashima, Y. Murakami, N. Hozumi: "Acquisition of Calibration Signal in Space Charge Measurement by Pulsed Electrostatic Method", Proc. 2022 IEEE International Conference on High Voltage Engineering and Application, P G-8, Sep. 25-29, Chongqing, China.
57. S. Zahra, S. Morita, M. Utagawa, T. Kawashima,Y. Murakami, N. Hozumi, P. Morshuis, Y-I. Cho, Y-H. Kim: "Space Charge Measurement Equipment for Full-Scale HVDC Cables Using Electrically Insulating Polymeric Acoustic Coupler," IEEE Transactions on Dielectrics and Electrical Insulation, Vol. 29, No. 3, pp. 1053-1061 (2022), doi: 10.1109/TDEI.2022.3169106.
58. X. Li, M. Utagawa, Y-G. An, T. Kawashima, Y. Murakami, N. Hozumi: "Space Charge Measurement of Thick Insulating Materials", Proc. 2022 IEEE 4th International Conference on Dielectrics (ICD), pp. 502-505.
59. Shafira Zahra, M. Utagawa1, T. Kawashima, Y. Murakami, N. Hozumi, P. Morshuis, Y-I. Cho, Y-H. Kim: “Two-dimensional Space Charge Measurement of Scaled Cable Joint Model”, Proc. 2022 IEEE 4th International Conference on Dielectrics (ICD), pp. 74-77.
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61. S. Morita, N. Fuse, T. Takahashi, T. Takahashi, S. Zahra and N. Hozumi, "Space Charge Measurement of 23-mm-Thick XLPE Cable at Ambient and High Temperatures", IEEE Transactions on Dielectrics and Electrical Insulation, Vol. 29, No. 4, pp. 1491-1497 (2022), doi: 10.1109/TDEI.2022.3185579.
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63. N. Hozumi, X. Li, T. Kawashima, Y. Murakami: "Fundamental Study on Calibration of Space Charge Distribution by Frequency-resolved Analysis", Proc. 2022 Int'l. Conf. Conditioning Monitoring and Diagnoses, C1-5, pp. 142-145.
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66. Y. An, X. Li, T. Kawashima, Y. Murakami, N. Hozumi, "Signal Processing for Space Charge Measurement Using Laplace Deconvolution", Proc. 2022 Int'l. Conf. Conditioning Monitoring and Diagnoses, P4-23, pp. 811-814.

(4) Dynamic charge observation

67. N. Hozumi, Y. Muramoto, M. Nagao, Y. Zhang: "Carrier Mobility in Ethylene-vinylacetate Copolymer Estimated by Transient Space Charge", IEEE Trans on Dielectr. & Electr. Insul.,Vol.8, No.5, pp.849--853 (2001).
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(5) Diagnostics and asset management

71. H. Fukagawa, T. Okamoto, N. Hozumi, T. Shibata: "Development of a Method to Estimate the Residual Life of XLPE Cables Deteriorated by Water Trees", Proc. 2nd Int'l Conf. on Insulated Power Cables (JICABLE87), #A10.1 pp.457-462, Paris, France (1987).
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Materials (ISEIM), Aichi, Japan, V2-20, pp.559-562 (2017).

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87. K. Yata, M. Utagawa. T, Kawashima, Y, Murakami, N. Hozumi: "Dielectric Spectroscopy under Extremely High Voltages", Proc. 2022 Int'l. Conf. Conditioning Monitoring and Diagnoses, P1-33, pp. 392-395.

(6) Ultrasonic measurement and application to medicine and biology

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