

BIBLIOGRAPHY

- [1] L. Kebbabi and A. Beroual, "Optical and electrical characterization of creeping discharges over solid/liquid interfaces under lightning impulse voltage," *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 13, no. 3, pp. 565–571, June 2006.
- [2] X. Yi, "Characteristics of creepage discharges along ester-pressboard interfaces under ac stress," Ph.D. dissertation, The University of Manchester (United Kingdom), 2012.
- [3] E. A. Goodman, "Today's transformer insulation systems," *IEEE Transactions on Industry Applications*, vol. IA-8, no. 4, pp. 404–411, July 1972.
- [4] M. Wang, A. J. Vandermaar, and K. D. Srivastava, "Review of condition assessment of power transformers in service," *IEEE Electrical Insulation Magazine*, vol. 18, no. 6, pp. 12–25, Nov 2002.
- [5] A. Zouaghi and A. Beroual, "Barrier effect on the dielectric strength of oil gaps under dc voltage," in *Conference Record of the 1998 IEEE International Symposium on Electrical Insulation (Cat. No.98CH36239)*, vol. 2, June 1998, pp. 640–643 vol.2.
- [6] A. Beroual and A. Boubakeur, "Influence of barriers on the lightning and switching impulse strength of mean air gaps in point/plane arrangements," *IEEE Transactions on Electrical Insulation*, vol. 26, no. 6, pp. 1130–1139, Dec 1991.
- [7] I. Fofana, A. Beroual, and A. Boubakeur, "Influence of insulating barriers on positive long air gaps in divergent field," in *1999 Eleventh International Symposium on High Voltage Engineering*, vol. 3, Aug 1999, pp. 321–324 vol.3.

- [8] K. Siodla, W. Ziomek, and E. Kuffel, "The volume and area effect in transformer oil," in *Conference Record of the the 2002 IEEE International Symposium on Electrical Insulation (Cat. No.02CH37316)*, April 2002, pp. 359–362.
- [9] Y. Kawaguchi, H. Murata, and M. Ikeda, "Breakdown of transformer oil," *IEEE Transactions on Power Apparatus and Systems*, vol. PAS-91, no. 1, pp. 9–23, Jan 1972.
- [10] Y. Bertrand and L. C. Hoang, "Vegetal oils as substitute for mineral oils," in *Proceedings of the 7th International Conference on Properties and Applications of Dielectric Materials (Cat. No.03CH37417)*, vol. 2, June 2003, pp. 491–494 vol.2.
- [11] M. Eklund, "Mineral insulating oils; functional requirements, specifications and production," in *Conference Record of the 2006 IEEE International Symposium on Electrical Insulation*, June 2006, pp. 68–72.
- [12] F. Murdiya, "Research on creeping discharge phenomena in insulating oils: vegetable-based oils as substitute of mineral oil," Ph.D. dissertation, Ph. D Thesis, Department of Electrical and Electronic Engineering, Kanazawa Institute of Technology (KIT), Japan, 2015.
- [13] Q. Liu and Z. D. Wang, "Streamer characteristic and breakdown in synthetic and natural ester transformer liquids with pressboard interface under lightning impulse voltage," *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 18, no. 6, pp. 1908–1917, December 2011.
- [14] I. Fofana, J. S. N'cho, J. C. Olivares-Galvan, R. Escarela-Perez, and P. S. Georgilakis, "Comparative studies of the stabilities to oxidation and electrical discharge between ester fluids and transformer oils," in *2011 North American Power Symposium*, Aug 2011, pp. 1–4.
- [15] B. Ellis, *Chemistry and Technology of Epoxy Resins*. Springer Netherlands, 01 1993.

- [16] S. Singha and M. J. Thomas, "Dielectric properties of epoxy nanocomposites," *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 15, no. 1, pp. 12–23, February 2008.
- [17] C. Zhang, R. Mason, and G. C. Stevens, "Dielectric properties of alumina-polymer nanocomposites," in *CEIDP '05. 2005 Annual Report Conference on Electrical Insulation and Dielectric Phenomena, 2005.*, Oct 2005, pp. 721–724.
- [18] C. Zou, J. C. Fothergill, and S. W. Rowe, "The effect of water absorption on the dielectric properties of epoxy nanocomposites," *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 15, no. 1, pp. 106–117, February 2008.
- [19] S.-H. Xie, B.-K. Zhu, J.-B. Li, X.-Z. Wei, and Z.-K. Xu, "Preparation and properties of polyimide/aluminum nitride composites," *Polymer testing*, vol. 23, no. 7, pp. 797–801, 2004.
- [20] J. Wang and X.-S. Yi, "Preparation and the properties of pmr-type polyimide composites with aluminum nitride," *Journal of applied polymer science*, vol. 89, no. 14, pp. 3913–3917, 2003.
- [21] C. P. Wong and R. S. Bollampally, "Comparative study of thermally conductive fillers for use in liquid encapsulants for electronic packaging," *IEEE Transactions on Advanced Packaging*, vol. 22, no. 1, pp. 54–59, Feb 1999.
- [22] T. Tanaka, Y. Ohki, M. Ochi, M. Harada, and T. Imai, "Enhanced partial discharge resistance of epoxy/clay nanocomposite prepared by newly developed organic modification and solubilization methods," *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 15, no. 1, pp. 81–89, February 2008.
- [23] L. Schadler, L. Brinson, and W. Sawyer, "Polymer nanocomposites: a small part of the story," *Jom*, vol. 59, no. 3, pp. 53–60, 2007.
- [24] H. Zainuddin, "Study of surface discharge behaviour at the oil-pressboard interface," Ph.D. dissertation, University of Southampton, 2013.

- [25] K. Jang, “Creepage discharge behaviour and numerical model analysis at the oil/pressboard interface with the effect of nano composite coating,” Ph.D. dissertation, , 2017.
- [26] J. A. Lapworth and A. Wilson, “Transformer internal over-voltages caused by remote energisation,” in *2007 IEEE Power Engineering Society Conference and Exposition in Africa - PowerAfrica*, July 2007, pp. 1–6.
- [27] P. Jarman, Z. Wang, Q. Zhong, and M. Ishak, “End-of-life modelling for power transformers in aged power system networks,” 08 2009.
- [28] A. Beroual and L. Kebbabi, “Influence of hydrostatic pressure on morphology and final length of creeping discharges over solid/liquid interfaces under impulse voltages,” in *2008 IEEE International Conference on Dielectric Liquids*, June 2008, pp. 1–4.
- [29] Partial discharge. [Online]. Available: <http://rbswitchgeargroup.com/partial-discharge>
- [30] J. Lucas, D. Abeysundara, C. Weerakoon, K. Perera, K. Obadage, and K. Gunatunga, “Coconut oil insulated distribution transformer,” in *IEE Sri Lanka Annual Conference*, 2001, pp. 1–5.
- [31] B. S. H. M. S. Y. Matharage, M. A. R. M. Fernando, M. A. A. P. Bandara, G. A. Jayantha, and C. S. Kalpage, “Performance of coconut oil as an alternative transformer liquid insulation,” *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 20, no. 3, pp. 887–898, June 2013.
- [32] J. G. C. Samuel, G. Lucas, M. Fu, P. J. Howard, and S. Lafon-Placette, “Nanodielectrics research for application to high voltage insulation systems,” in *2012 47th International Universities Power Engineering Conference (UPEC)*, Sept 2012, pp. 1–6.

- [33] K. Y. Lau and M. Piah, "Polymer nanocomposites in high voltage electrical insulation perspective: a review," *Malaysian Polymer Journal*, vol. 6, no. 1, pp. 58–69, 2011.
- [34] M. Liang and K. Wong, "Improving the long-term performance of composite insulators use nanocomposite: A review," *Energy Procedia*, vol. 110, pp. 168–173, 2017.
- [35] L. Niemeyer, L. Pietronero, and H. J. Wiesmann, "Fractal dimension of dielectric breakdown," *Physical Review Letters - PHYS REV LETT*, vol. 52, pp. 1033–1036, 03 1984.
- [36] T. Cavallo *et al.*, "Ii. an account of some new experiments in electricity, with the description and use of two new electrical instruments," *Philosophical Transactions of the Royal Society of London*, vol. 70, pp. 15–29, 1780.
- [37] B. Silliman Jr and W. H. Goode, "A daguerreotype experiment by galvanic light," *Journal of the Franklin Institute*, vol. 35, no. 1, pp. 68–70, 1843.
- [38] J. A. De Luc, *Idées sur la météorologie*. Spilsbury, 1786, vol. 1.
- [39] J. M. Eder, *Ausführliches handbuch der photographie*. W. Knapp, 1884, vol. 1.
- [40] Y. Takahashi, "Two hundred years of lichtenberg figures," *Journal of Electrostatics*, vol. 6, no. 1, pp. 1 – 13, 1979. [Online]. Available: <http://www.sciencedirect.com/science/article/pii/0304388679900202>
- [41] G. C. Lichtenberg and H. Pupke, *Über eine neue Methode, die Natur und die Bewegung der Elektrischen Materie zu erforschen: "Lichtenbergsche Figuren"*. Akademische Verlagsgesellschaft Geest & Portig, 1956, no. 246.
- [42] R. Hewa Lunuwilage, "Study of pole-top fire development in power distribution networks," Ph.D. dissertation, URMIT University, 2013.
- [43] O. N. Rood, "Art. xxii.–on the study of the electric spark by the aid of photography," *American Journal of Science and Arts (1820-1879)*, vol. 33, no. 98, p. 219, 1862.

- [44] M. Toepler, "Über den inneren aufbau von gleitbüscheln und die gesetze ihrer leuchtfäden," *Annalen der Physik*, vol. 358, no. 11, pp. 217–234, 1917.
- [45] C. E. Magnusson, "Lichtenberg figures," *Journal of the A.I.E.E.*, vol. 47, no. 11, pp. 828–835, Nov 1928.
- [46] P. O. Pedersen, *On the Lichtenberg figures*. Høst, 1919.
- [47] F. H. Merrill and A. Von Hippel, "The atomphysical interpretation of lichtenberg figures and their application to the study of gas discharge phenomena," *Journal of Applied Physics*, vol. 10, no. 12, pp. 873–887, 1939. [Online]. Available: <https://doi.org/10.1063/1.1707274>
- [48] J. G. Anderson and T. W. Liao, "Propagation mechanism of discharge on oil surfaces," *Electrical Engineering*, vol. 74, no. 10, pp. 909–909, Oct 1955.
- [49] A. M. Thomas, "'heat developed" and "powder" lichtenberg figures and the ionization of dielectric surfaces produced by electrical impulses," *British Journal of Applied Physics*, vol. 2, no. 4, p. 98, 1951. [Online]. Available: <http://stacks.iop.org/0508-3443/2/i=4/a=303>
- [50] E. Nasser, "Some physical properties of electrical discharges on contaminated-surfaces," *IEEE Transactions on Power Apparatus and Systems*, vol. PAS-87, no. 4, pp. 957–963, April 1968.
- [51] E. Nasser and D. C. Schroder, "Secondary leader channels in the impulse breakdown of air and nitrogen," *Journal of Applied Physics*, vol. 40, no. 7, pp. 2793–2799, 1969. [Online]. Available: <https://doi.org/10.1063/1.1658077>
- [52] E. Nasser, "Development of spark in air from a negative point," *Journal of Applied Physics*, vol. 42, no. 7, pp. 2839–2847, 1971. [Online]. Available: <https://doi.org/10.1063/1.1660636>
- [53] B. Gross, "Irradiation effects in plexiglas," *Journal of Polymer Science*, vol. 27, no. 115, pp. 135–143, 1958. [Online]. Available: <https://onlinelibrary.wiley.com/doi/abs/10.1002/pol.1958.1202711511>

- [54] J. D. Cross, K. D. Srivastava, and J. A. Chavez, "Optical observations of discharges across dielectric surfaces in vacuum and in air," in *Conference on Electrical Insulation Dielectric Phenomena - Annual Report 1972*, Oct 1972, pp. 91–97.
- [55] A. Kawashima and S. Hoh, "Lichtenberg figures on various electrical insulating materials," *IEEE Transactions on Electrical Insulation*, vol. EI-13, no. 1, pp. 51–56, Feb 1978.
- [56] P. M. Mitchinson, "Surface tracking in the inter-phase region of large transformers," Ph.D. dissertation, University of Southampton, 2008.
- [57] A. H. Sharbaugh, J. C. Devins, and S. J. Rzed, "Progress in the field of electric breakdown in dielectric liquids," *IEEE Transactions on Electrical Insulation*, vol. EI-13, no. 4, pp. 249–276, Aug 1978.
- [58] J. C. Devins and S. J. Rzed, "Streamer propagation in liquids and over liquid-solid interfaces," in *Conference on Electrical Insulation Dielectric Phenomena - Annual Report 1982*, Oct 1982, pp. 383–394.
- [59] S. Ohgaki and Y. Tsunoda, "A study of the positive streamer growth under surface discharge configuration in liquid paraffin," *IEEE Transactions on Electrical Insulation*, vol. EI-19, no. 6, pp. 594–601, Dec 1984.
- [60] P. Atten and A. Sakker, "Streamer propagation over a liquid-solid interface," in *10th International Conference on Conduction and Breakdown in Dielectric Liquids*, Sept 1990, pp. 441–445.
- [61] R. Hanaoka, T. Kohrin, T. Miyagawa, and T. Nishi, "Creepage discharge characteristics over solid-liquid interfaces with grounded side electrode," *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 9, no. 2, pp. 308–315, April 2002.
- [62] A. Beroual and N. K. Bedoui, "Influence of hydrostatic pressure on the characteristics of discharges propagating on solid/liquid insulating interfaces under

- ac and dc voltages,” in *Proceedings of 2002 IEEE 14th International Conference on Dielectric Liquids. ICDL 2002 (Cat. No.02CH37319)*, July 2002, pp. 207–210.
- [63] L. Kebbabi and A. Beroual, “Influence of the properties of materials and the hydrostatic pressure on creepage discharge characteristics over solid/liquid interfaces,” in *2003 Annual Report Conference on Electrical Insulation and Dielectric Phenomena*, Oct 2003, pp. 293–296.
- [64] ———, “Fractal analysis of creeping discharge patterns propagating at solid/liquid interfaces-influence of the nature and geometry of solid insulators,” in *CEIDP '05. 2005 Annual Report Conference on Electrical Insulation and Dielectric Phenomena, 2005.*, Oct 2005, pp. 132–135.
- [65] A. Beroual and L. Kebbabi, “Influence of hydrostatic pressure on morphology and final length of creeping discharges over solid/liquid interfaces under impulse voltages,” in *2008 IEEE International Conference on Dielectric Liquids*, June 2008, pp. 1–4.
- [66] ———, “Influence of capacitive effects on the characteristics of creeping discharges propagating over solid/liquid interfaces under impulse voltages,” in *2008 Annual Report Conference on Electrical Insulation and Dielectric Phenomena*, Oct 2008, pp. 357–360.
- [67] ———, “Analysis of cumulative number and polarity of creeping discharges initiated at solid/liquid interfaces subjected to ac voltage,” in *2009 IEEE Conference on Electrical Insulation and Dielectric Phenomena*, Oct 2009, pp. 380–383.
- [68] A. Beroual, M. L. Coulibaly, O. Aitken, and A. Girodet, “Study of creeping discharges propagating over epoxy resin insulators in presence of different gases and mixtures,” in *2010 International Conference on High Voltage Engineering and Application*, Oct 2010, pp. 89–92.
- [69] A. Beroual and V. Dang, “Fractal analysis of creeping discharge propagating over pressboard immersed in mineral and vegetable oils,” in *2011 Annual Report*

Conference on Electrical Insulation and Dielectric Phenomena, Oct 2011, pp. 501–504.

- [70] V. Dang and A. Beroual, “Investigations on creeping discharges propagating over pressboard immersed in mineral and vegetable oils submitted to impulse voltage,” in *2011 Annual Report Conference on Electrical Insulation and Dielectric Phenomena*, Oct 2011, pp. 411–414.
- [71] S. Zohdi, K. L. Wong, H. L. Rasara, and C. Henschke, “Study of creeping discharge on hardwood timber under ac and dc voltages,” in *2013 Australasian Universities Power Engineering Conference (AUPEC)*, Sept 2013, pp. 1–5.
- [72] Y. Z. Lv, Y. Zhou, C. R. Li, K. B. Ma, Q. Wang, W. Wang, S. N. Zhang, and Z. Y. Jin, “Nanoparticle effects on creeping flashover characteristics of oil/pressboard interface,” *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 21, no. 2, pp. 556–562, April 2014.
- [73] F. Sadaoui and A. Beroual, “Ac creeping discharges propagating over solid and gas interfaces,” *IET Science, Measurement Technology*, vol. 8, no. 6, pp. 595–600, 2014.
- [74] M. A. Douar, A. Beroual, and X. Souche, “Propagation of creeping discharges in air depending on the electric field direction and insulator materials under lightning impulse voltage,” in *2015 IEEE Conference on Electrical Insulation and Dielectric Phenomena (CEIDP)*, Oct 2015, pp. 880–883.
- [75] Y. Lv, Y. Zhou, C. Li, Y. Ge, and B. Qi, “Creeping discharge characteristics of nanofluid-impregnated pressboards under ac stress,” *IEEE Transactions on Plasma Science*, vol. 44, no. 11, pp. 2589–2593, Nov 2016.
- [76] X. Zhou, H. B. Shi, M. Kuhnke, P. Werle, E. Gockenbach, and H. Borsi, “Evolution and discharge pattern of creeping discharge at aged oil/pressboard interface,” in *2016 IEEE Conference on Electrical Insulation and Dielectric Phenomena (CEIDP)*, Oct 2016, pp. 1053–1056.

- [77] A. Beroual and F. Sadaoui, "Analysis of partial discharges and their development into creeping discharges at solid/gas interface under ac voltage," in *2017 IEEE Electrical Insulation Conference (EIC)*, June 2017, pp. 38–41.
- [78] T. Nishikawa, R. Hanaoka, K. Miyagi, K. Takamoto, and S. Nishikawa, "Creeping discharge at vegetable-based oil/pressboard interface under rectangular impulse voltage," in *2017 IEEE 19th International Conference on Dielectric Liquids (ICDL)*, June 2017, pp. 1–4.
- [79] Y. Sawada, S. Ohta, M. Yamazaki, and H. Honjo, "Self-similarity and a phase-transition-like behavior of a random growing structure governed by a nonequilibrium parameter," *Phys. Rev. A*, vol. 26, pp. 3557–3563, Dec 1982. [Online]. Available: <https://link.aps.org/doi/10.1103/PhysRevA.26.3557>
- [80] R. McLeod, D. Liu, W. Pries, K. Kao, and H. Card, "Polarity dependence of fractal geometry in partial discharge in dielectrics," *Solid state communications*, vol. 56, no. 2, pp. 197–199, 1985.
- [81] S. Satpathy, "Dielectric breakdown in three dimensions," in *Fractals in Physics*. Elsevier, 1986, pp. 173–176.
- [82] H. J. Wiesmann and H. R. Zeller, "A fractal model of dielectric breakdown and prebreakdown in solid dielectrics," in *Conference on Electrical Insulation Dielectric Phenomena - Annual Report 1986*, Nov 1986, pp. 385–390.
- [83] S. Fujimori, "Analysis of electric discharge with fractal dimension," in *Conference on Electrical Insulation Dielectric Phenomena - Annual Report 1984*, Oct 1984, pp. 374–380.
- [84] K. Kudo and S. Maruyama, "Fractals of computer simulated tree," in *Annual Conference on Electrical Insulation and Dielectric Phenomena*, Oct 1990, pp. 502–507.

- [85] T. Czaszejko, “3-d electrical network model of water tree,” in *Proceedings of Conference on Electrical Insulation and Dielectric Phenomena - CEIDP '96*, vol. 2, Oct 1996, pp. 799–802 vol.2.
- [86] L. A. Dissado, J. C. Fothergill, N. Wise, and J. Cooper, “A deterministic model for branched structures in the electrical breakdown of solid polymeric dielectrics,” *Journal of Physics D: Applied Physics*, vol. 33, no. 19, p. L109, 2000. [Online]. Available: <http://stacks.iop.org/0022-3727/33/i=19/a=103>
- [87] H. Uehara and K. Kudo, “Temporal propagation characteristics of simulation tree considering growth probability,” in *Proceedings of 2005 International Symposium on Electrical Insulating Materials, 2005. (ISEIM 2005).*, vol. 1, June 2005, pp. 17–20 Vol. 1.
- [88] D. Amarasinghe and U. Sonnadara, “Fractal characteristics of simulated electrical discharges,” *Journal of the National Science Foundation of Sri Lanka*, vol. 36, no. 2, pp. 137–143, 2008.
- [89] A. Garg, A. Agrawal, and A. Negi, “A review on natural phenomenon of fractal geometry,” *International Journal of Computer Application*, vol. 86, no. 4, 2014.
- [90] J. Theiler, “Estimating fractal dimension,” *JOSA A*, vol. 7, no. 6, pp. 1055–1073, 1990.
- [91] K. Kudo, “Fractal analysis of electrical trees,” *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 5, no. 5, pp. 713–727, Oct 1998.
- [92] ———, “On the regularity of the branching structure of electrical trees,” in *Proceedings of the Twenty-First Symposium on Electrical Insulating Materials*, Sept 1988, pp. 203–206.
- [93] S. M. Prigarin, K. Sandau, M. Kazmierczak, and K. Hahn, “Estimation of fractal dimension: A survey with numerical experiments and software description,” *International Journal of Biomathematics and Biostatistics*, vol. 2, no. 1, pp. 167–180, 2013.

- [94] L. Kebbabi and A. Beroual, “Fractal analysis of creeping discharge patterns propagating at solid/liquid interfaces: influence of the nature and geometry of solid insulators,” *Journal of Physics D: Applied Physics*, vol. 39, no. 1, p. 177, 2005.
- [95] P. Grassberger and I. Procaccia, “Measuring the strangeness of strange attractors,” *Physica D: Nonlinear Phenomena*, vol. 9, no. 1-2, pp. 189–208, 1983.
- [96] Z. Kalantan and J. Einbeck, “On the computation of the correlation integral for fractal dimension estimation,” in *2012 International Conference on Statistics in Science, Business and Engineering (ICSSBE)*, Sept 2012, pp. 1–6.
- [97] A. Beroual, L. Kebbabi, E. A. Al-Ammar, and M. I. Qureshi, “Analysis of creeping discharges activity at solid/liquid interfaces subjected to ac voltage,” *IET Generation, Transmission Distribution*, vol. 5, no. 9, pp. 973–978, September 2011.
- [98] A. Beroual, M. L. Coulibaly, O. Aitken, and A. Girodet, “Effect of micro-fillers in polytetrafluoroethylene insulators on the characteristics of surface discharges in presence of SF₆ CO₂ and SF₆-CO mixture,” *IET Generation, Transmission and Distribution*, vol. 6, no. 10, pp. 951 – 957, Oct. 2012. [Online]. Available: <https://hal.archives-ouvertes.fr/hal-00742439>
- [99] A. Beroual and M. Coulibaly, “Fractal analysis of creeping discharge propagating over solid insulators immersed in gases at different pressures,” in *2012 Annual Report Conference on Electrical Insulation and Dielectric Phenomena*, Oct 2012, pp. 335–338.
- [100] A. Beroual, “Relationship between the physicochemical properties of materials and the fractal dimension of creeping discharges propagating at solid/fluid interfaces,” in *2016 IEEE International Power Modulator and High Voltage Conference (IPMHVC)*, July 2016, pp. 296–299.
- [101] W. E. P. S. Ediriweera, K. L. I. M. P. B. Jayarathna, J. R. Lucas, and R. Samarasinghe, “Effect of the shape of the insulator on fractal characteristics of creeping

- discharges,” in *2018 Moratuwa Engineering Research Conference (MERCon)*, May 2018, pp. 506–510.
- [102] F. Murdiya, “Research on creeping discharge phenomena in insulating oils: vegetable-based oils as substitute of mineral oil,” Ph.D. dissertation, Ph. D Thesis, Department of Electrical and Electronic Engineering, Kanazawa Institute of Technology (KIT), Japan, 2015.
- [103] H. Lee and S. Lee, “Finite element analysis of positive streamer propagation with lightning impulse voltage,” in *2010 International Conference on Electrical Machines and Systems*, Oct 2010, pp. 1836–1839.
- [104] M. Akyuz, L. Gao, V. Cooray, T. G. Gustavsson, S. M. Gubanski, and A. Larsson, “Positive streamer discharges along insulating surfaces,” *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 8, no. 6, pp. 902–910, Dec 2001.
- [105] C. W. Reed, “Functionalization of nanocomposite dielectrics,” in *2010 IEEE International Symposium on Electrical Insulation*, June 2010, pp. 1–4.
- [106] R. Kochetov, *Thermal and electrical properties of nanocomposites, including material processing*, 2012.
- [107] B. Raju, B. Suresha, R. Swamy, and K. Bharath, “The effect of silicon dioxide filler on the wear resistance of glass fabric reinforced epoxy composites,” *polymer composites*, vol. 18, p. 20, 2012.
- [108] M. Reading and A. S. Vaughan, “Comparison of rheological, thermal and electrical properties of poly(ethylene oxide) composites with micro and nano sized silicon dioxide filler,” in *2010 10th IEEE International Conference on Solid Dielectrics*, July 2010, pp. 1–4.
- [109] N. Loganathan and S. Chandrasekar, “Physicochemical properties investigation in nano sized SiO_2 filled silicone rubber for high voltage insu-

- lation applications,” in *2012 IEEE 10th International Conference on the Properties and Applications of Dielectric Materials*, July 2012, pp. 1–4.
- [110] M. M. S. Shirazi, H. Borsi, and E. Gockenbach, “Evaluation of the influence of nano fillers on the electrical and dielectric properties of epoxy resin,” in *2011 Electrical Insulation Conference (EIC)*., June 2011, pp. 498–501.
- [111] J. Dai, Z. D. Wang, and P. Jarman, “Creepage discharge on insulation barriers in aged power transformers,” *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 17, no. 4, pp. 1327–1335, August 2010.
- [112] Y. Nakao, A. Mouri, T. Itooka, H. Tagashira, Y. Nakagami, M. Miyamoto, and Y. Sakai, “Propagation of creepage discharge on solid insulator in insulating oil,” in *Proceedings of 1999 IEEE 13th International Conference on Dielectric Liquids (ICDL’99) (Cat. No.99CH36213)*, July 1999, pp. 257–260.
- [113] L. Lundgaard, D. Linhjell, G. Berg, and S. Sigmond, “Propagation of positive and negative streamers in oil with and without pressboard interfaces,” *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 5, no. 3, pp. 388–395, June 1998.
- [114] M. Koch and S. Tenbohlen, “Evolution of bubbles in oil-paper insulation influenced by material quality and ageing,” *IET Electric Power Applications*, vol. 5, no. 1, pp. 168–174, January 2011.
- [115] O. Lesaint, A. Saker, P. Gournay, R. Tobazeon, J. Aubin, and M. Mailhot, “Streamer propagation and breakdown under ac voltage in very large oil gaps,” *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 5, no. 3, pp. 351–359, June 1998.
- [116] L. E. Lundgaard and O. Lesaint, “Discharges in liquids in point-plane gap under ac and impulse stress,” in *Proceedings of 1995 Conference on Electrical Insulation and Dielectric Phenomena*, Oct 1995, pp. 596–599.

- [117] B. F. Hampton, "Engineering problems of surface flashover," in *IEE Colloquium on Charging and Tracking of Insulators in Gaseous and Vacuum Environments*, May 1990, pp. 1/1–1/4.
- [118] E. F. Kelley and R. E. Hebner, "Electro-optic field measurement at a needle tip and streamer initiation in nitrobenzene," in *Conference on Electrical Insulation Dielectric Phenomena - Annual Report 1986*, Nov 1986, pp. 272–277.
- [119] P. Girdino, P. Molfino, G. Molinari, A. Viviani, G. J. Fitzpatrick, and E. O. Forster, "Effect of streamer shape and dimensions on local electric field conditions," *IEEE Transactions on Electrical Insulation*, vol. 23, no. 4, pp. 669–676, Aug 1988.
- [120] W. Chadband, "On variations in the propagation of positive discharges between transformer oil and silicone fluids," *Journal of Physics D: Applied Physics*, vol. 13, no. 7, p. 1299, 1980.
- [121] O. Lesaint, R. Kattan, and A. Denat, "Generation and growth of gaseous bubbles in hydrocarbon liquids under high divergent field," in *1988. Annual Report., Conference on Electrical Insulation and Dielectric Phenomena*, Oct 1988, pp. 269–274.
- [122] Y. Nakao, A. Mouri, T. Itooka, H. Tagashira, Y. Nakagami, M. Miyamoto, and Y. Sakai, "Propagation of creepage discharge on solid insulator in insulating oil," in *Proceedings of 1999 IEEE 13th International Conference on Dielectric Liquids (ICDL'99) (Cat. No.99CH36213)*, July 1999, pp. 257–260.
- [123] M. Krins, H. Borsi, and E. Gockenbach, "Impact of carbon particles on the electrical strength of different solid/liquid interfaces in a non-uniform field," in *Conference Record of the 1998 IEEE International Symposium on Electrical Insulation (Cat. No.98CH36239)*, vol. 2, June 1998, pp. 623–626 vol.2.
- [124] K. Jang, T. Akahoshi, M. Kozako, and M. Hikita, "Nano sio₂/epoxy coating effect on creepage discharge characteristics in oil/pressboard composite insulation

- system,” in *2016 IEEE International Conference on Dielectrics (ICD)*, vol. 1, July 2016, pp. 394–397.
- [125] S. Singha and M. J. Thomas, “Dielectric properties of epoxy nanocomposites,” *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 15, no. 1, pp. 12–23, February 2008.
- [126] H. Zainuddin, P. Lewin, and P. Mitchinson, “Modeling the inter-phase region of high voltage transformers,” in *Dielectric Liquids (ICDL), 2011 IEEE International Conference on*. IEEE, 2011, pp. 1–4.
- [127] V.-H. Dang, A. Beroual, M. Coulibaly, and C. Perrier, “Investigation on creeping discharges propagating over pressboard immersed in mineral and vegetable oils submitted to ac and dc voltages,” in *2012 International Conference on High Voltage Engineering and Application*, Sept 2012, pp. 215–218.
- [128] T. Tanaka, “A novel concept for electronic transport in nanoscale spaces formed by islandic multi-cored nanoparticles,” in *2016 IEEE International Conference on Dielectrics (ICD)*, vol. 1, July 2016, pp. 23–26.
- [129] —, “A quantum dot model for permittivity of polymer nanocomposites,” in *2016 IEEE Conference on Electrical Insulation and Dielectric Phenomena (CEIDP)*, Oct 2016, pp. 40–43.
- [130] A. Beroual, M.-L. Coulibaly, A. Girodet, and O. Aitken, “Relationship between the fractal dimension of creeping discharges propagating at solid/gas interfaces and the characteristics parameters of interfaces,” *International Review of Electrical Engineering*, vol. 9, pp. 460–465, 01 2014.
- [131] D. Faircloth, “Technological aspects: High voltage,” *arXiv preprint arXiv:1404.0952*, 2014.
- [132] Z. Dianchun, W. Zhengwei, Z. Dawei, and Y. Weiguo, “Effects of molecular ionization energy on liquid streamer development under dc,” in *Ifostr*, vol. 1, June 2013, pp. 207–211.

- [133] G. J. FitzPatrick, P. J. McKenny, and E. O. Forster, "The effect of pressure on streamer inception and propagation in liquid hydrocarbons," *IEEE Transactions on Electrical Insulation*, vol. 25, no. 4, pp. 672–682, Aug 1990.
- [134] O. Lesaint, R. Kattan, and A. Denat, "Generation and growth of gaseous bubbles in hydrocarbon liquids under high divergent field," in *1988. Annual Report., Conference on Electrical Insulation and Dielectric Phenomena*, Oct 1988, pp. 269–274.
- [135] O. Lesaint and P. Gournay, "On the gaseous nature of positive filamentary streamers in hydrocarbon liquids. i: Influence of the hydrostatic pressure on the propagation," *Journal of Physics D: Applied Physics*, vol. 27, no. 10, p. 2111, 1994.
- [136] W. H. Middendorf and G. H. Brown, "Liquid dielectrics in an electric field," *Electrical Engineering*, vol. 78, no. 12, pp. 1158–1158, Dec 1959.
- [137] X. Yi and Z. Wang, "Creepage discharge on pressboards in synthetic and natural ester transformer liquids under ac stress," *IET Electric Power Applications*, vol. 7, no. 3, pp. 191–198, 2013.
- [138] O. Lesaint, P. Gournay, and R. Tobazeon, "Investigations on transient currents associated with streamer propagation in dielectric liquids," *IEEE Transactions on Electrical Insulation*, vol. 26, no. 4, pp. 699–707, Aug 1991.
- [139] F. Murdiya, R. Hanaoka, H. Akiyama, K. Miyagi, K. Takamoto, and T. Kano, "Creeping discharge developing on vegetable-based oil / pressboard interface under ac voltage," *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 21, no. 5, pp. 2102–2110, Oct 2014.
- [140] A. Beroual and V. Dang, "Fractal analysis of creeping discharge propagating over pressboard immersed in mineral and vegetable oils," in *2011 Annual Report Conference on Electrical Insulation and Dielectric Phenomena*, Oct 2011, pp. 501–504.

- [141] U. Pal, R. Patra, N. Sahoo, C. Bakhara, and M. Panda, "Effect of refining on quality and composition of sunflower oil," *Journal of food science and technology*, vol. 52, no. 7, pp. 4613–4618, 2015.
- [142] "Sunflower processing." [Online]. Available: <https://www.crowniron.com/oilseed-processing/sunflower-processing/>
- [143] A. Regitano Neto, A. Rauen, A. Mourad, E. Aparecida Henriques, and R. Alves, "Environmental effect on sunflower oil quality," *Crop Breeding and Applied Biotechnology*, vol. 16, pp. 197–204, 09 2016.
- [144] *Production Method of Soyabean*. [Online]. Available: <http://shodhganga.inflibnet.ac.in/bitstream/10603/88938/3/04-chapter203.pdf>
- [145] "Soybean oil production." [Online]. Available: <http://www.oilmillmachinery.net/Soybean-Oil-Production.html>
- [146] B. S. H. M. S. Y. Matharage, M. A. A. P. Bandara, M. A. R. M. Fernando, G. A. Jayantha, and C. S. Kalpage, "Aging effect of coconut oil as transformer liquid insulation comparison with mineral oil," in *2012 IEEE 7th International Conference on Industrial and Information Systems (ICIIS)*, Aug 2012, pp. 1–6.