

### **Air-core inductive current sensor for fast transients measurements in distribution networks**

**Kütt, Lauri; Järvi, Jaan; Kilter, Jako;** Shafiq, Muhammad; Lehtonen, Matti PQ2012 : 8th International Conference : 2012 Electric Power Quality and Supply Reliability : June 11-13, 2012, Tartu, Estonia : conference proceedings 2012 / p. 249-252 : ill  
[https://www.researchgate.net/publication/261507011\\_Air-core\\_inductive\\_current\\_sensor\\_for\\_fast\\_transients\\_measurements\\_in\\_distribution\\_networks](https://www.researchgate.net/publication/261507011_Air-core_inductive_current_sensor_for_fast_transients_measurements_in_distribution_networks)

### **Air-core sensors operation modes for partial discharge detection and on-line diagnostics in medium voltage networks**

**Kütt, Lauri;** Shafiq, Muhammad; **Mölder, Heigo; Järvi, Jaan;** Lehtonen, Matti Scientific Journal of Riga Technical University. Electrical, control and communication engineering 2013 / p. 5-12 : ill

### **Characteristic pulse pattern features of different types of partial discharge sources in power cables**

**Kiitam, Ivar; Shafiq, Muhammad; Taklaja, Paul; Parker, Martin; Palu, Ivo; Kütt, Lauri** IEEE Power Engineering Society Conference and Exposition in Africa, PowerAfrica, IEEE PES/IAS PowerAfrica, Nairobi, Kenya, 23-27 Aug 2021 : proceedings 2021 / 5 p. : ill <https://doi.org/10.1109/PowerAfrica52236.2021.9543366>

### **Characterization of corona and internal partial discharge under increasing electrical stress using time domain analysis**

Shafiq, Muhammad; **Kiitam, Ivar; Taklaja, Paul;** Hussain, Amjad; **Kütt, Lauri;** Kauhaniemi, Kimmo 2020 IEEE Electrical Insulation Conference : EIC 2020 2020 / vol. 217-220 <https://doi.org/10.1109/EIC47619.2020.9158701>

### **Comparison of machine learning algorithms for classification of partial discharge signals in medium voltage components**

Kumar, Haresh; **Shafiq, Muhammad;** Hussain, Ghulam Amjad; Kauhaniemi, Kimmo 2021 IEEE PES Innovative Smart Grid Technologies Europe (ISGT-Europe), 8-21 October, 2021 : proceedings 2021 / 6 p  
<https://doi.org/10.1109/ISGTEurope52324.2021.9639923>

### **Comparison of operating modes of air-core inductive sensors for partial discharge on-line diagnostics in medium voltage networks**

**Kütt, Lauri;** Shafiq, Muhammad; Lehtonen, Matti; **Mölder, Heigo; Järvi, Jaan** Digest book and electronic proceedings : 54th International Scientific Conference of Riga Technical University : Section of Power and Electrical Engineering 2013 / p. 29.1-29.6 : ill  
<https://research.aalto.fi/en/publications/comparison-of-operating-modes-of-air-core-inductive-sensors-for-p>

### **A Comprehensive Study of Partial Discharge Based Extrinsic Aging in Nomex Insulation Films : Modeling, Simulation and Measurement**

**Choudhary, Maninder;** Shafiq, Muhammad; Bhattarai, Abhinav; **Kiitam, Ivar; Taklaja, Paul; Palu, Ivo** Electric Power Systems Research 2025 / art. 111663 <https://doi.org/10.1016/j.epsr.2025.111663>

### **Denoising and extraction of partial discharge pulse characteristics using wavelet denoising and local maxima method**

**Choudhary, Maninder; Palu, Ivo; Kiitam, Ivar;** Shafiq, Muhammad; **Taklaja, Paul;** Bhattarai, Abhinav 2024 IEEE International Conference on Power and Energy (PECon) 2024 / p. 221-225 <https://doi.org/10.1109/PECon62060.2024.10827085>

### **Design and applications of Rogowski coil sensors for power system measurements : a review**

**Shafiq, Muhammad;** Stewart, Brian G.; Hussain, Ghulam Amjad; Hassan, Waqar; **Choudhary, Maninder; Palo, Ivo** Measurement : Journal of the International Measurement Confederation 2022 / art. 112014, 10 p. : ill <https://doi.org/10.1016/j.measurement.2022.112014>  
[Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

### **Design of high-frequency transient current sensor for powerline on-line measurement**

**Kütt, Lauri; Järvi, Jaan; Kilter, Jako;** Shafiq, Muhammad; Lehtonen, Matti Electrical and control technologies : proceedings of the 7th international conference on electrical and control technologies ECT-2012 2012 / p. 212-216 : ill  
<https://research.aalto.fi/publications/design-of-high-frequency-transient-current-sensor-for-powerline-o>

### **A detailed testing procedure of numerical differential protection relay for EHV auto transformer**

Ehsan, Umer; Jawad, Muhammad; Javed, Umar; Zaidi, Khuram Shabih; Rehman, Ateeq Ur; **Rassölkin, Anton;** Althobaiti, Maha M.; Hamam, Habib; **Shafiq, Muhammad** Energies 2021 / art. 8447 <https://doi.org/10.3390/en14248447> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

### **Diagnostics analysis of partial discharge events of the power cables at various voltage levels using ramping behavior analysis method**

Mishra, Sambeet; **Singh, Praveen Prakash; Kiitam, Ivar; Shafiq, Muhammad; Palu, Ivo;** Bordin, Chiara Electric power systems research 2024 / art. 109988 <https://doi.org/10.1016/j.epsr.2023.109988> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

### **Directional calibration of rogowski coil for localization of partial discharges in smart distribution networks**

Shafiq, Muhammad; **Kütt, Lauri;** Isa, M.; Hashmi, M.; Lehtonen, Matti International review of electrical engineering 2012 / p. 5881-5890  
[https://www.researchgate.net/publication/262703688\\_Directional\\_Calibration\\_of\\_Rogowski\\_Coil\\_for\\_Localization\\_of\\_Partial\\_Discharges\\_in\\_Smart\\_Distribution\\_Networks](https://www.researchgate.net/publication/262703688_Directional_Calibration_of_Rogowski_Coil_for_Localization_of_Partial_Discharges_in_Smart_Distribution_Networks)

### **High-frequency current sensor for power network on-line measurements**

**Kütt, Lauri; Järvi, Jaan; Vaimann, Toomas; Shafiq, Muhammad; Lehtonen, Matti; Kilter, Jako** Proceedings of the 13th International Scientific Conference Electric Power Engineering 2012 : EPE 2012 : Brno. Vol. 1 2012 / p. 367-371 : ill [https://www.researchgate.net/publication/262674502\\_High-Frequency\\_Current\\_Sensor\\_for\\_Power\\_Network\\_On-line\\_Measurements](https://www.researchgate.net/publication/262674502_High-Frequency_Current_Sensor_for_Power_Network_On-line_Measurements)

**Identification and location of PD defects in medium voltage underground power cables using high frequency current transformer**

Shafiq, Muhammad; **Kiitam, Ivar; Taklaja, Paul; Kütt, Lauri;** Kauhaniemi, Kimmo; **Palu, Ivo** IEEE Access 2019 / art. 8771171, p. 103608 - 103618 : ill <https://doi.org/10.1109/ACCESS.2019.2930704> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

**Improved quantification of partial discharges for reliable diagnostics of multipath connections in MV substations**

**Shafiq, Muhammad; Kiitam, Ivar;** Isa, Muzamir; **Taklaja, Paul; Palu, Ivo; Kütt, Lauri** 2021 IEEE 62nd International Scientific Conference on Power and Electrical Engineering of Riga Technical University (RTUCON) 2021 / 6 p <https://doi.org/10.1109/RTUCON53541.2021.9711585>

**Insulation fault diagnosis for MV cables under smart grid operation**

**Shafiq, Muhammad** 20th International Symposium "Topical problems in the field of electrical and power engineering. Doctoral school of energy and geotechnology. III" : Tallinn, Estonia, September 8-10, 2021 2021 / p. 13-14 : ill [https://www.eester.ee/record=b5457278\\*est](https://www.eester.ee/record=b5457278*est)

**Investigating the progression of insulation degradation in power cable based on partial discharge measurements**

Hassan, Waqar; **Shafiq, Muhammad;** Hussain, Ghulam Amjad; **Choudhary, Maninder; Palu, Ivo** Electric power systems research 2023 / art. 109452 <https://doi.org/10.1016/j.epsr.2023.109452> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

**Investigation and field measurements for demand side management control technique of smart air conditioners located at residential, commercial, and industrial sites**

Masood, Bilal; Guobing, Song; Nebhen, Jamel; Rehman, Ateeq Ur; **Iqbal, Muhammad Naveed;** Rasheed, Ifthikhar; Bajaj, Mohit; Shafiq, Muhammad; Hamam, Habib Energies 2022 / art. 2482, 23 p. : ill <https://doi.org/10.3390/en15072482> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

**Investigation of partial discharge characteristics in XLPE cable insulation under increasing electrical stress**

**Choudhary, Maninder;** Shafiq, Muhammad; **Kiitam, Ivar; Palu, Ivo;** Hassan, Waqar; **Singh, Praveen Prakash** Engineering failure analysis 2024 / art. 108006 <https://doi.org/10.1016/j.engfailanal.2024.108006> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

**Magnetic current sensor stray components in high frequency operation and their effects**

**Kütt, Lauri; Järvi, Jaan; Mölder, Heigo; Kilter, Jako;** Shafiq, Muhammad Conference proceedings : 2012 11th International Conference on Environment and Electrical Engineering : Venice, Italy, 18-25 May 2012 2012 / p. 617-620 : ill <https://ieeexplore.ieee.org/abstract/document/6221451>

**Magnetic sensor coil shape geometry and bandwidth assessment**

**Kütt, Lauri;** Shafiq, Muhammad 7th International Conference-workshop Compatibility and Power Electronics : CPE 2011 : Tallinn, Estonia, June 3, 2011 : student forum 2011 / p. 58-61 : ill

**Online partial discharge diagnostics in medium voltage branched cable networks**

Shafiq, Muhammad; Lehtonen, Matti; Isa, M.; **Kütt, Lauri** Proceedings of 2013 Fourth International Conference on Power Engineering, Energy and Electrical Drives (POWERENG) : Istanbul, Turkey, 13-17 May 2013 2013 / p. 246-251 : ill <https://ieeexplore.ieee.org/abstract/document/6635614>

**Parameters identification and modeling of high-frequency current transducer for partial discharge measurements**

Shafiq, Muhammad; **Kütt, Lauri;** Lehtonen, Matti; Nieminen, Tatu; Hashmi, Murtaza IEEE sensors journal 2013 / p. 1081-1091 : ill <https://doi.org/10.1109/JSEN.2012.2227712> [https://www.academia.edu/101513170/Parameters\\_Identification\\_and\\_Modeling\\_of\\_High\\_Frequency\\_Current\\_Transducer\\_for\\_Partial\\_Discharge\\_Measurements](https://www.academia.edu/101513170/Parameters_Identification_and_Modeling_of_High_Frequency_Current_Transducer_for_Partial_Discharge_Measurements) [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

**Partial discharge pulse shape analysis for progression of insulation degradation in medium voltage cable**

**Choudhary, Maninder; Shafiq, Muhammad; Kiitam, Ivar; Palu, Ivo;** Hassan, Waqar 2023 International Electrical Engineering Congress (iEECON) 2023 / p. 332-336 <https://doi.org/10.1109/IEECON56657.2023.10126589>

**Performance comparison of PD data acquisition techniques for condition monitoring of medium voltage cables**

Shafiq, Muhammad; **Kiitam, Ivar;** Kauhaniemi, Kimmo; Taklaja, Paul; **Kütt, Lauri; Palu, Ivo** Energies 2020 / art. 4272, 14 p. : ill <https://doi.org/10.3390/en13164272> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

**Performance evaluation of additive manufacturing based test samples for studies of defects in electrical insulation**

**Shafiq, Muhammad; Taklaja, Paul; Kiitam, Ivar; Tiismus, Hans; Palu, Ivo; Kütt, Lauri** 2021 International Conference on Electrical, Computer and Energy Technologies (ICECET) 2021 / 6 <https://doi.org/10.1109/ICECET52533.2021.9698476>

**Performance evaluation of PD monitoring technique integrated into medium voltage cable network for smart condition assessment**

Shafiq, Muhammad; Lehtonen, Matti; Hussain, Ghulam A.; **Kütt, Lauri** PQ2014 : the 9th International 2014 Electric Power Quality and Supply Reliability Conference (PQ) : June 11-13, 2014, Rakvere, Estonia : proceedings 2014 / p. 351-357 : ill

**Precision and accuracy of pulse propagation velocity measurement in power cables**

**Kiitam, Ivar; Shafiq, Muhammad; Choudhary, Maninder; Parker, Martin; Palu, Ivo; Taklaja, Paul** Energies 2023 / art. 2702

<https://doi.org/10.3390/en16062702> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

**A review of aging models for electrical insulation in power cables**

**Choudhary, Maninder; Shafiq, Muhammad; Kiitam, Ivar; Hussain, Amjad; Palu, Ivo; Taklaja, Paul** Energies 2022 / Art. nr. 3408

<https://doi.org/10.3390/en15093408> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

**Rogowski coil : an efficient current measurement sensor for power system applications**

**Shafiq, Muhammad** 21st International Symposium "Topical problems in the field of electrical and power engineering. Doctoral

school of energy and geotechnology. III" : Pärnu, Estonia, June 15-18, 2022 2022 / p. 7-8 : ill [https://www.ester.ee/record=b5504019\\*est](https://www.ester.ee/record=b5504019*est)

**Sensor resonance and its influence on the measurement results of fast transients**

**Kütt, Lauri; Shafiq, Muhammad; Lehtonen, Matti; Mölder, Heigo; Järvik, Jaan** Proceedings of the International Conference on Power Systems Transients (IPST2013) in Vancouver, Canada July 18-20, 2013 2013 / [7] p.: ill

[https://www.ipstconf.org/papers/Proc\\_IPST2013/13IPST134.pdf](https://www.ipstconf.org/papers/Proc_IPST2013/13IPST134.pdf)

**Study of partial discharge characteristics in medium voltage cable insulation with internal defect**

**Choudhary, Maninder; Palu, Ivo; Kiitam, Ivar; Shafiq, Muhammad; Taklaja, Paul** 2024 IEEE International Conference on High

Voltage Engineering and Applications (ICHVE) 2024 / 4 p <https://doi.org/10.1109/ICHVE61955.2024.10676188>

**Study of the behaviour of partial discharges for proactive diagnostics in medium voltage cables**

**Shafiq, Muhammad; Kiitam, Ivar; Taklaja, Paul; Parker, Martin; Palu, Ivo; Kütt, Lauri** 2021 IEEE PES/IAS PowerAfrica,

PowerAfrica 2021 2021 / p. 1-5 <https://doi.org/10.1109/PowerAfrica52236.2021.9543233>

**Study on the progression of surface partial discharge in power cables**

**Choudhary, Maninder; Shafiq, Muhammad; Kiitam, Ivar; Palu, Ivo; Taklaja, Paul** 2022 IEEE 63th International Scientific

Conference on Power and Electrical Engineering of Riga Technical University (RTUCON): conference proceedings 2022 / 6 p

<https://doi.org/10.1109/RTUCON56726.2022.9978804>