1. Record Nr. UNINA9910806192903321 Autore Dong Xuzhu **Titolo** The Proceedings of 2023 4th International Symposium on Insulation and Discharge Computation for Power Equipment (IDCOMPU2023) [[electronic resource]]: Volume I / / edited by Xuzhu Dong, Li Cai Singapore:,: Springer Nature Singapore:,: Imprint: Springer.. 2024 Pubbl/distr/stampa **ISBN** 981-9973-93-7 Edizione [1st ed. 2024.] Descrizione fisica 1 online resource (698 pages) Collana Lecture Notes in Electrical Engineering, , 1876-1119; ; 1100 Altri autori (Persone) CaiLi 621.31937 Disciplina Soggetti Electric power production **Electronics Electrical Power Engineering** Electronics and Microelectronics, Instrumentation Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Intro -- Contents -- The Effect of Contact Structure on Electromagnetic Nota di contenuto Force -- 1 Introduction -- 2 Contact Structures and Simulation Method -- 3 Simulation Results -- 4 Conclusion -- References -- Partial Discharge Characteristics of Millimeter Metal Particle on a GIS Insulator Surface Under Long-Term Constant Voltage -- 1 Introduction -- 2 Experiment Arrangement -- 2.1 Experiment Platform -- 2.2 PD Detection System -- 2.3 Experimental Model -- 2.4 Defect Setting --2.5 Voltage Application -- 3 Experiment Results -- 3.1 PD Characteristics -- 4 Conclusion -- References -- Ultrasound-Based

Force -- 1 Introduction -- 2 Contact Structures and Simulation Method -- 3 Simulation Results -- 4 Conclusion -- References -- Partial Discharge Characteristics of Millimeter Metal Particle on a GIS Insulator Surface Under Long-Term Constant Voltage -- 1 Introduction -- 2 Experiment Arrangement -- 2.1 Experiment Platform -- 2.2 PD Detection System -- 2.3 Experimental Model -- 2.4 Defect Setting -- 2.5 Voltage Application -- 3 Experiment Results -- 3.1 PD Characteristics -- 4 Conclusion -- References -- Ultrasound-Based Pressure Pipe Internal Water Ingress Defect Detection Technology -- 1 Introduction -- 2 Model Building -- 2.1 Basic Principle -- 2.2 Model Physics -- 2.3 Parameter Setting and Loading -- 3 Detect Echo Amplitude Characteristics at Different Locations -- 4 Optimal Detection of Ultrasonic Frequencies -- 4.1 Effect of Ultrasonic Frequency on Echo Morphology -- 4.2 The Effect of Ultrasonic Frequency on Echo Amplitude -- 4.3 Selection of the Optimal Ultrasonic Testing Frequency -- 5 Simulation Study of Different Inlet Depths -- 5.1 The Depth of the Water Influent Affects the Echo Time -- 5.2 The Effect of the Depth of the Incoming Water on the Echo Amplitude -- 6 Conclusion -- References -- Optical Storage Emergency Power Supply

Technology for Railway Locomotive -- 1 Introduction -- 2 Emergency Power Supply Device System Design -- 3 Booster Circuit Design -- 4 Inverter Circuit Design -- 4.1 Principle of Three-Phase Inverter Circuit -- 4.2 Voltage Vector of Three-Phase Inverter Circuit -- 4.3 Three-Phase Inverter Filter Design -- 5 Simulation and Experimental Waveforms -- 6 Conclusion -- References -- Condition Monitoring Technology for Temperature and Strain Status of Disconnector Based on SAW -- 1 Introduction -- 2 Force-Field Analysis of Disconnector Finger.

3 Design and Development of SAW Sensors -- 4 Testing of Wireless Monitoring System for Disconnector -- 5 Conclusion -- References --Adsorption of SF6/N2 Decomposed Gas in NaA, MFI and NaZSM-5 Molecular Sieves -- 1 Introduction -- 2 Method of Calculation -- 3 Calculation Results and Analysis -- 3.1 Adsorption Isotherm of SO2, NF3, SO2F2 and CS2 on Molecular Sieve -- 3.2 Adsorption Heat of SO2. NF3, SO2F2, and CS2 on Molecular Sieves -- 4 Conclusion --References -- Pre-sowing Treatment Using Plasma-Activated Water to Enhance the Germination of Cucumber Seeds Under Salt Stress -- 1 Introduction -- 2 Material and Method -- 2.1 Reactor to Produce PAW -- 2.2 Production of PAW -- 2.3 Characterization of PAW -- 2.4 Seed Germination Statistics and Morphological Indicators -- 3 Results -- 3.1 Electrical Characters Diagnosis -- 3.2 Chemical Composition Detection of PAW -- 3.3 Characterization of Seeds -- 4 Discussion -- 5 Conclusions -- References -- Ultrasonic Image Recognition of Terminal Lead Seal Defects Based on Convolutional Neural Network -- 1 Introduction -- 2 Basic Theory of Convolutional Neural Network -- 2.1 Convolutional Neural Network Structure -- 2.2 Convolutional Neural Training Method -- 3 Lead Seal Defect Recognition Based on Convolutional Neural Network -- 3.1 Image Recognition Process --3.2 Lead Seal Defect Detection Platform -- 3.3 CNN Network Model Establishment -- 4 Experimental Result Analysis -- 4.1 A Subsection Sample -- 5 Conclusion -- References -- Temperature Distribution and Influencing Factors of 110 kV Single Core Cable Joint -- 1 Introduction -- 2 Single Core Cable Joint Model -- 2.1 Cable Joint Model Parameters -- 2.2 Governing Equation of Temperature Field --2.3 Heat Source Analysis -- 3 Temperature Field Distribution of Single Core Cable Joint -- 4 Influencing Factors of Cable Joint Temperature --4.1 Load Current.

4.2 Ambient Temperature -- 5 Conclusion -- References -- Loss Calculation of GIS Disconnect Switches Considering Contact Resistance and Skin Effect -- 1 Introduction -- 2 Model Simplification and Model Assumptions -- 2.1 Model Simplification -- 2.2 Model Assumptions --3 Theoretical Analysis -- 3.1 Vortex Field Control Equation -- 3.2 Skinning Effect and Proximity Effect -- 3.3 Boundary Conditions -- 4 Numerical Calculation of Eddy Current Field -- 4.1 Mesh Dissection --4.2 Verification of Grid Validity Considering Skinning Depth -- 4.3 Excitation and Boundary Condition Settings -- 4.4 Result Analysis -- 5 Conclusion -- References -- A Novel Virtual Power Plant Model with Ito Integral Considering Random Noise of Renewable Energy -- 1 Introduction -- 2 VPP Continuous Scheduling Optimization Model --2.1 Objective Function of VPP -- 2.2 Constraint Conditions of VPP -- 3 Novel Stochastic Differential Model of VPP -- 4 Case Analysis -- 4.1 Input Parameters -- 4.2 Detailed Analysis -- 5 Conclusion --References -- Research on AlexNet Model-Based Partial Discharge Diagnosis of Cable Terminals -- 1 Introduction -- 2 Cable Partial Discharge Test -- 2.1 Test Methods -- 2.2 Test Results -- 3 Partial Discharge Defect Type Recognition Based on AlexNet Model -- 3.1 Principle of Convolutional Neural Networks -- 3.2 AlexNet Model -- 3.3

Construction of Recognition Network Model -- 4 Analysis of the Recognition Effect -- 5 Conclusion -- References -- Double-Ended Localization Method Based on Joint VMD and WVD Time-Frequency Analysis -- 1 Introduction -- 2 Based on Joint VMD and WVD Time-Frequency Analysis -- 2.1 Shortcomings of Conventional WVD Time-Frequency Analysis -- 2.2 Joint VMD and WVD Time-Frequency Analysis -- 3 Based on Joint VMD and WVD Time-frequency Analysis --3.1 Traditional Double-Ended Traveling Wave Method. 3.2 Improved Double-Ended Positioning Combining VMD and WVD -- 4 Analysis of Positioning Effects -- 5 Conclusion -- References --Particle-In-Cell/Monte Carlo Collisional Simulation of Space Charge Layer Formation and Development in Nitrogen Negative Streamers -- 1 Introduction -- 2 Model Description -- 3 Results and Discussion -- 4 Conclusion -- References -- Research on Switchgear Partial Discharge Signal Type Identification Based on Composite Neural Network -- 1 Introduction -- 2 Theoretical Foundation -- 2.1 BPNN -- 2.2 Whale Optimization Algorithm (WOA) -- 3 Improved Whale Optimization Algorithm (CIWOA) -- 3.1 Cubic Mapping -- 3.2 Adaptive Inertia Weights -- 3.3 Convergence Factor Improvement -- 3.4 Algorithm Process -- 4 Signal Simulation and Feature Extraction -- 4.1 Partial Discharge Signal Establishment -- 4.2 Signal Denoising and Feature Extraction -- 5 CIWOA-BP Partial Discharge Pattern Recognition -- 5.1 Algorithm Performance Test -- 5.2 Comparison of Recognition Results -- 6 Conclusion -- References -- Research on Partial Discharge Noise Reduction Method of Motor Based on SVD-VMD -- 1 Introduction -- 2 Basic Theory -- 2.1 Singular Value Decomposition -- 2.2 Variational Mode Decomposition -- 2.3 Kurtosis -- 3 Simulation Analysis -- 3.1 Simulation PD -- 3.2 Denoising Process -- 3.3 Denoising Analysis --3.4 Denoising Contrast -- 4 Conclusion -- References -- Simulation of Seawater Orifice Intrusion of 500 kV Submarine Oil-Filled Cable -- 1 Introduction -- 2 Mathematical Model -- 3 Simulation Model -- 3.1 Geometric Model -- 3.2 Simulation Conditions -- 4 Results and Analysis -- 4.1 Effect of Different Depths on the Length of Seawater Entering the Cable -- 4.2 Effect of Different Locations at the Same Depth on the Length of Seawater Entering the Cable Interior -- 5 Conclusion -- References. 3-D Segmentation and Surface Reconstruction of Gas Insulated Switchgear via PointNet-MLS Architecture -- 1 Introduction -- 2 Raw Point Could Data Acquire and Preprocessing of GIS -- 2.1 GIS Point Cloud Data Set Construction -- 3 Component Segmentation and Surface Reconstruction Framework -- 3.1 PointNET-Based Component Segmentation -- 3.2 MLS-Based Surface Reconstruction --4 Results and Discussion -- 4.1 Poind Cloud Segmentation Results --4.2 Surface Reconstruction Results -- 5 Conclusion -- References --Optimization of Electromagnetic Vibration for FSPM Motor by NSGA-II Algorithm -- 1 Introduction -- 2 Radial Electromagnetic Force Analysis -- 2.1 Characteristics of Radial Electromagnetic Force -- 2.2 FEM Simulation of Radial Electromagnetic Force -- 2.3 Harmonic Response Analysis of Radial Electromagnetic Force -- 3 Low Electromagnetic Vibration Optimization Design -- 4 Analysis of Optimization Results --5 Conclusion -- References -- Simulation and Analysis of Charge Distribution and Capacitance Effect on Uneven Surface of Dielectric with Leakage Current -- 1 Introduction -- 2 Boundary Value Problem of Dielectric with Leakage Current -- 2.1 Charge Division Between the Two States -- 2.2 Extended Law of Conservation of Charge and Application of Excitation Source -- 2.3 Initial Boundary Value Problem of the Field -- 2.4 The Initial Boundary Value Problem of Potential and the Application of Excitation Source -- 3 Volume

Capacitance and Surface Capacitance Characteristics of the Dielectric with Leakage Current -- 4 Simulation of the Charge Distribution and Capacitance Effect on Uneven Surface -- 5 Conclusion -- References -- Thermal Simulation Model of Oil-Immersed Transformer and Analysis of Temperature Rise Characteristics Under Winding Fault -- 1 Introduction -- 2 Simulation Model -- 2.1 Model Parameter -- 2.2 Faulty Module.

2.3 Heat Dissipation Process Analysis and Control Equation.

Sommario/riassunto

This book includes original, peer-reviewed research papers from the 2023 4th International Symposium on Insulation and Discharge Computation for Power Equipment (IDCOMPU2023), held in Wuhan, China. The topics covered include but are not limited to: insulation, discharge computations, electric power equipment, and electrical materials. The papers share the latest findings in the field of insulation and discharge computations of electric power equipment, making the book a valuable asset for researchers, engineers, university students, etc.