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模糊熵應用於高電壓電纜接頭之瑕疵辨識

The Application of Fuzzy Entropy on Defect
Recognition for High Voltage Cable Joints

研究生: Nguyen Tung Lam

指導教授: 吳瑞南 博士

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Thesis Advisor: Ruzy-Nan Wu



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Department : Department of Electrical Engineering

Student's Name: NGUYEN TUNG LAM

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RECOGNITION FOR HIGH VOLTAGE CABLE JOINTS

This is to certify that the thesis submitted by the student named above, has been
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Advisor: Ruzy-Nan Wu

Co-advisor:

Advisor's Signature:

Date: 2016.7.9 (yyyy/mm/dd)



碩士學位考試委員會審定書

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Department: Department of Electrical Engineering

Student's Name: NGUYEN TUNG LAM

Thesis Title:

THE APPLICATION OF FUZZY ENTROPY ON DEFECT RECOGNITION FOR HIGH VOLTAGE CABLE JOINTS

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Date: 2014.7.16 (yyyy/mm/dd)


M10107815
Thesis Advisor: Ruay-Nan Wu

ABSTRACT

Partial discharge (PD) measurement is one of the most important diagnostics methods of insulation systems in high voltage equipment. PD evaluates conveniently and effectively the insulation status and its prospective condition. Partial discharge activities may stem from various defects, and its characteristics correspondingly behave differently. In this research, the PD patterns are produced by two different laboratory models representing two kinds of defect in high voltage cable joints. The PD data was collected from a set of experiments in PD tests with six high voltage cable joints which include artificial defects. From the PD pattern data, statistical features were extracted and the number of features was reduced by fuzzy entropy algorithm. Support vector machine (SVM) was used to train and then used to recognize the source of the PDs. Results show that SVM classification has the highest successful rate when using features input determined by fuzzy entropy and success rate reaches 95.83%. As the result, features which are meaningful with defect classification goal in cable joints were determined.

Keywords: partial discharge, high voltage cable joint, feature selection, fuzzy entropy, pattern recognition, support vector machine (SVM).

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