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高电压技术

基于双向二维最大间距准则的局部放电灰度图像特征提取

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摘要：

针对高压交联聚乙烯电力电缆中间接头绝缘缺陷的辨识问题，提出一种局部放电灰度图像特征提取的双向二维最大间距准则方法，对获取的局部放电灰度图像从水平和垂直2个方向进行投影，得到了不同类别灰度图的鉴别矢量，选用最近邻分类器进行局部放电分类，以辨识电缆中间接头出现的不同绝缘缺陷。该方法解决了局部放电灰度图像特征提取维数大、识别样本少的难题。在对实验室4种典型电缆接头绝缘缺陷产生的PD信号进行对比辨识表明，其局部放电特征提取的速度和绝缘缺陷的识别率优于常用的主成分分析或Fisher鉴别分析方法。

关键词：

Partial Discharge Gray Image Feature Extraction Based on Bi-directional Two-Dimensional Maximum Margin Criterion

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Abstract:

In allusion to the recognition of insulation defect in intermediate joint of XLPE cable, a novel method to extract the feature of partial discharge (PD) grey image based on bi-directional two-dimensional maximum margin criterion (MMC) is proposed. According to the proposed method, firstly based on MMC the obtained PD grey image is projected in two directions, i.e., the horizontal direction and vertical direction, to extract discriminating vectors for different kinds of grey images, then the nearest neighbor classifier is chosen to classify the PD to recognize different insulation defects in intermediate joint of XLPE cable. The proposed method solves the difficulty of high dimension of grey image feature of PD and less samples to be recognized. The comparative recognition results of PD signals due to four kinds of typical insulation defects of intermediate joint of XLPE cable show that as for the performances in extraction speed of PD feature and recognition rate the proposed method is better the commonly used principal component analysis (PCA) and Fisher discriminant analysis (FDA).

Keywords:

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