Contribution ID: **37**   Type: **Poster Presentation**

Simulation research on the extraction of partial discharge ultrasonic direct wave signal

Monday 4 June 2018 13:30 (1h 30m)

The effective identification of ultrasonic direct wave signal is the key to the success of the partial discharge(PD) location of electrical equipment, and it is also a hot spot of research at home and abroad. Based on this, this paper proposes a method based on improved support vector machine (Improved SVM) to identify PD ultrasonic direct wave signal. The parameters of support vector machine are optimized by improved particle swarm optimization (PSO) algorithm, and then the direct wave signal is extracted. Firstly, the time domain waveform of PD ultrasonic direct wave and aliasing wave signals received by the ultrasonic sensor are modeled, and extracting their various characteristics. Secondly, by observing and comparing, the fractal box dimension characteristics of direct wave and aliasing wave signals are selected and the database is established, then use cross validation to select training set and test set. Finally, Simulation Research on the recognition of PD ultrasonic direct wave signal based on ISVM algorithm is carried out, then the direct wave signal is extracted. The simulation results show that compared with the traditional PD ultrasonic direct wave signal extraction method, this method performs fast and the accuracy of classification is high.

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Session Classification: Poster 1 - Dielectrics and Electromagnetic Phenomena