

Title: A novel method to distinguish between noise and partial discharge signal by spectrum analysis and phase relevant pattern

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Abstract:

Due to the effective use of diagnostics for insulation materials, partial discharge measurement is broadly applied to estimate the condition of insulator. However, the majority problem of on-site partial discharge measurement is the elimination of background noise under dirty electric environment. The common methods to eliminate noise are to arise measurement frequency and bandwidth to increase signal to noise ratio, and to filter out noise by wavelet filter. On authors' experience, the high frequency components sometimes remain as the partial discharge source is far away and the noise waveforms sometimes are similar to partial discharge signal. These phenomena usually make the above method improper at on-site partial discharge measurement. Therefore, authors propose a novel method to distinguish between noise and partial discharge signal by combination of spectrum analysis and phase relevant pattern. The full-span characteristic of partial discharge signal is used to be distinguished from noise by spectrum analysis. The random characteristic of noise is utilized to tell apart by phase relevant pattern. At the end of this paper, authors utilize an on-site measurement as example showing this method provides good aid to identify noise and partial discharge signal.