Online partial discharge testing of power cables in high noise environment

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Condition monitoring of power equipment is a key tool to ensure their reliability and safe operation. Partial discharge (PD) detection of underground power cable has been proven as one of the reliable techniques of condition monitoring for the purpose of condition based maintenance of power cables. Online PD monitoring is a valuable tool to assess the condition of power cables while in service. This paper will present the case studies conducted in different substations with high noise. Detecting partial discharges (PD) is simple when low background noise or interference is present. However, measurements become practically difficult to extract PD signals from noise. Sometimes, PD signals are much lesser in magnitude than the noise or superimposed onto the noise or interference signals making it difficult for simple pulse location algorithms to extract PD signals. Acquiring data at high sampling rate (greater than100MS/s) and taking the advantage of signal processing techniques, it makes possible to extract PD signals in high noise conditions. Different de-noising techniques are being discussed in literature; this paper will present the techniques that serve the purpose for successful PD testing of power cables along with their implementation in real substation environment.