On-line partial discharge screening of MV and HV cables: feasibility and potential

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While the health conditions of the HV and MV cable assets of utilities and industrial plants are becoming a problem, due to the increased mean age and the lack of proper commissioning tests, there is a lack of testing procedure allowing for a rapid and effective screening of the cable system conditions. Most often, off-line partial discharge tests are carried out, which are a reliable source of information for the presence of PD and the way to localize them along a cable. However, they are expensive in terms of time and due to the need of supplying cables by external power sources.

On the contrary, on-line PD screening could be and effective procedure, provided that noise can be rejected efficiently.

This paper shows results of on-line PD testing of HV cables, where PD phenomena are separated from noise thanks to the time-frequency map technique. Cases regarding polymeric cables, rated between 88 and 220 kV, are presented and discussed, showing clear presence of partial discharges of amplitude above or below the external noise. The usefulness of on-line PD testing approach for diagnostic purposes and CBM procedures of cable systems is thus supported.