

Free-Space Radiometric Estimation of Apparent Charge in Partial Discharge Processes for the Monitoring of Insulation Integrity in High Voltage Systems

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Free-space radiometric (FSR) partial discharge (PD) measurements can be used to locate insulation defects [1, 2]. The monitoring of the relative intensity of such PD and, in particular its time-evolution, has been used to predict failure of HV equipment [3]. The work to be reported describes the calibration of PD sources required for the development of a PD wireless sensor network (WSN) such that absolute PD intensity (in pico-coulombs) might be inferred from the radiometric measurements. The approach uses a calibrated charge injection device to excite a PD emulator. The ERP from the excited emulator is measured using a bi-conical antenna with known antenna factor. Measurements have been repeated for four different PD emulators. The results of calculated ERP versus charge injection are summarised in Figure 1.

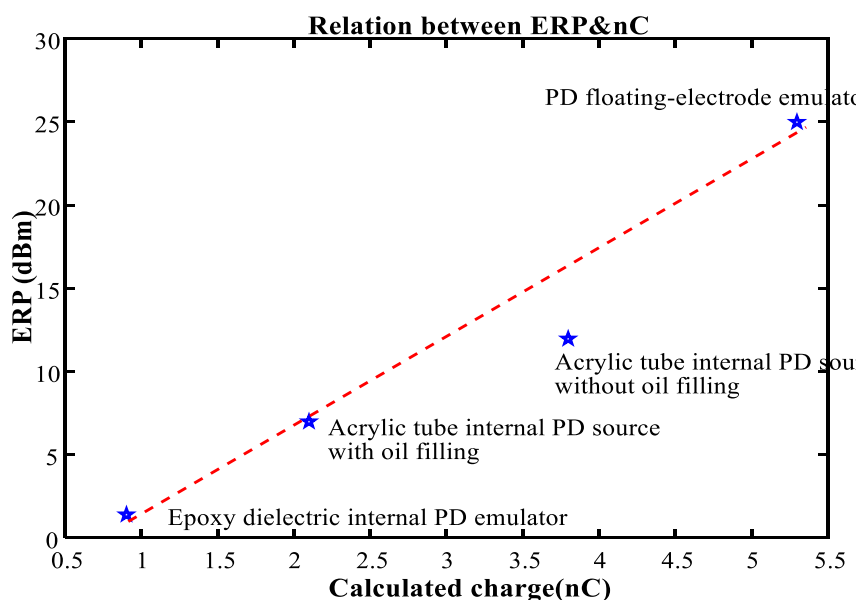


Fig. 1 PD source ERP versus injected charge

Figure 1 suggests that estimation of absolute PD intensity originating from HV insulation defects might be possible using FSR measurements alone. The presentation/poster will describe the PD emulators represented in Figure 1 and their ERP – apparent-charge calibration.

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References

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