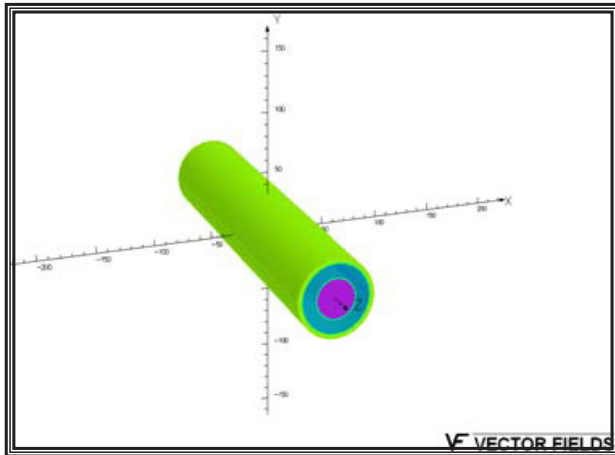
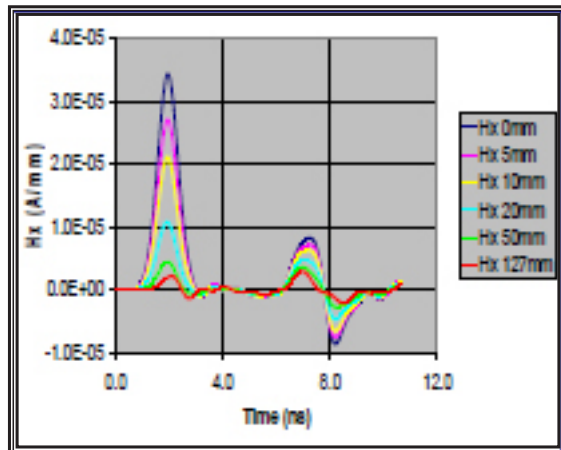


R&D Fund Project

Numerical Modeling & Simulation of Electromagnetic (EM) Wave Due To Partial Discharge (PD) Propagation in XPLE Cable



Cable model using the FDTD software



A typical simulated PD waveform at a certain distance inside the cable

Project Overview

This project is about the modeling & simulation of the PD signal propagation inside and outside the XLPE cable. The attenuation and propagation of the magnetic field components of the PD signal is studied, along the cable length and on the azimuthal plane of the cable. The simulation result shows that the magnetic field components due to PD are able to penetrate the cable outer sheath. A magnetic sensor is designed and constructed to detect this small transient signal. The new sensor is able to detect the transient magnetic field due to PD.

Deliverables

- A technique to model the PD source as an EM source.
- A modeling & simulation techniques to model PD signal propagation inside and outside the cable.
- A new magnetic sensor to detect the small transient magnetic field due to PD

Benefits

- A better understanding on the physics of the PD signals propagating inside and outside the cable.
- The PD can be detected from outside the cable, without interfering with the cable system.
- An early detection system may be made together with the new magnetic sensor.
- The PD modeling & simulation technique can be used in other electrical components.
- The behaviour of the PD signal can be predicted using the modelling & simulation.