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C1Po2A-01 [24]: Electrical Tree Aging of Epoxy-Based Nanocomposites at Cryogenic Temperature

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Epoxy resin plays an important role in the layer insulation of superconducting magnets. The quench phenomenon associated with superconducting magnets often leads to excessive interlayer voltages, which can cause electrical aging of insulating materials. In this paper, tests were conducted to study the tree aging in epoxy resin/BN nanocomposites at 77 K under AC voltages. An experimental cryostat for partial discharge (PD) with optical observation windows was set up. The test samples were prepared with three levels of nanofiller content: 0 wt %, 1 wt %, and 3 wt %. Each group of samples was tested at a range of AC voltages from 8 kV rms (root mean square) to 32 kV rms and the PD experiments were carried out at 298 K and 77 K.

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