

Uniform Current Distribution among Conductor Layers in HTS Cables using Inter-phase Transformers

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Uniform current distribution among conductor layers in HTS cables using IPTs (inter-phase transformers) was investigated. Conventional methods for current distribution, in which resistors are inserted to conductor layers, causes additional loss. In contrast, IPTs, which use magnetic coupling, make it possible that the current in parallel circuits is distributed uniformly with any load, and minimize the loss. In this study, IPTs were designed and fabricated for examination of uniform current distribution in the conductor layers of HTS cables. The ITP was designed through calculation of its impedance that can cancel the inductance of the conduction layers. The experimental setup consisted of four ITPs and four inductors that simulate the conductor layer inductance. Each layer was designed to feed 20A. We examined the behavior of current distribution with ITPs for various layer inductance.

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