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## **Fri-Af-Po.02-09: Investigation of near-symmetrical quench current decay in NI-like coils with current path design by PEC**

*Friday 4 July 2025 14:00 (2 hours)*

No-Insulation (NI) or NI-like techniques (including metal insulation) have become essential for quench protection in high-temperature superconducting (HTS) coils. However, the turn-to-turn resistance inherent to NI techniques is an intrinsic property that cannot be fully controlled by coil designers, leading to several challenges. One critical issue is asymmetric quench behavior, where the quenching of a specific section of the magnet causes a rapid current decay in the affected and adjacent coils, potentially resulting in mechanical imbalance within the magnet system. In this study, a method using the recently developed Partial-Electrical Connector (PEC) was proposed to address this issue. By designing PECs to partially insulate sections of the magnet, this approach aims to induce near-symmetrical quench behavior. The proposed concept was tested using sample double pancake coils (DPCs). Although achieving complete control remains challenging due to the need to maintain bypass current paths, this study demonstrates a viable method to optimize quench dynamics in magnet systems and presents new insights for improving quench behavior in HTS magnets.

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