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Thu-Mo-Po.04-02: Analysis on Critical Current Measurement of No-Insulation HTS Coils and its Correction and Compensation

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This paper presents both numerical and experimental investigations aimed at achieving accurate measurements of critical current in no-insulation (NI) high-temperature superconducting (HTS) coils. Leakage currents can flow through the turn-to-turn contact resistance in NI HTS coils. Additionally, screening current-induced voltages become dominant factors during the initial charging process. Both phenomena introduce additional errors and decrease the accuracy of critical current measurement. To address these challenges, we propose a method for correction and compensation that minimizes the impact of leakage currents and screening currents. Numerical and experimental results confirm that our approach improves the accuracy of critical current measurements in NI HTS coils.

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