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Analysis of Current Distribution in Rutherford Cables for Accelerator Magnets as an Engineering Tool

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We describe in this paper how the analysis of current distribution and redistribution in Nb3Sn Rutherford cables can be used to assist in the analysis of manufacturing issues and decision on the closure of major non-conformities. After describing the method and the model in detail, we apply it to the case of a cable defect next to the coil termination, a single strand breakage in a multi-strand cable, which could be thought as a relatively mild event. We show that in the range of parameters applicable to accelerator magnets even a minor defect can have the potential for significant performance reduction. These results have been instrumental to coming to a decision in the manufacturing flow.

Keywords

Category

Tools to support commissioning and operation phases of superconducting magnet systems

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