

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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