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Wed-Mo-Po3.10-06 [80]: Research on non-destructive examination of NbSn3 cables based on the method of inversion of electromagnetic property

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Superconducting cable is an important component of CICC conductor. The quality of the cable is the guarantee to ensure safe operation of superconducting conductor, and the key step to reduce the degeneration of superconducting conductor performance. The cables will be sustained extremely complex stress during manufacturing process, which is easily cause damage on strands and influent conductor performance. However, the spiral structure caused by irregular cabling with multiple materials, cores, and layers strengthen the complexity of CICC, which also brings more difficulties on R&D of non-destructive examination (NDE) of cable inspection. On the basis of electromagnetic NDE, this paper proposed a method based on inversion of electromagnetic property, and explores relative characteristics of cable damage single and magnetic leakage signal, as well as the synchronous NDE quantitative evaluation method through the combination of theoretical model and experimental research. Meanwhile, the wavelet transform is used to extract characteristics and reduce noise for strands signal, and then extract defect signal, which realizes the effectiveness of the new evaluation method in complex environment.

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