

MEASUREMENT OF AC LOSSES FOR APPLICATION OF Bi-2212 BULK SUPERCONDUCTOR IN FAULT CURRENT LIMITER

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ABSTRACT

A key issue for most applications of superconductivity involves AC losses. Designers need to understand the mechanisms of AC losses in order to lay out the conductors and windings correctly to predict the performance range in operation. AC losses in high temperature superconductor $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_x$ (Bi-2212) bulk material used in a fault current limiter model have been investigated through the measurement of the actual specific heat of the sample and a time varying magnetic field. This paper derives simple, if approximate, expression for calculating the losses in the most important cases for practical purposes. Four different orientations of the sample with respect to the field were tested and the results are shown graphically. It will be shown also the comparison between experimental calorimetric results and theoretical analysis of various direction of the applied field. AC loss characteristics were employed to evaluate the nominal and activation current of the full scale fault current limiter.

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