Current Distribution in HTSC Tapes Obtained by Inverse Problem Calculation

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Abstract - The development of SC devices based on HTSC tapes requires a deep knowledge of the current distribution in both pre-saturation and post-saturation regimes. Magnetic measurements have shown the possibilities to derive the current distribution by Inverse Problem Solution in finite sized bulks, based on a non-destructive measurement of the magnetic field created by the own current flowing in the SC. In this work, the QR inversion strategy is extended to non-finite systems by considering the effect of the boundaries. We present a method to derive the current distribution in a cross-section of a tape based on Hall magnetic mapping by using a specifically designed inverse problem solver. This method is applied to a series of Hall measurements corresponding to a full magnetization cycle of a commercial tape, produced by applying a set of the currents applied to the tape of several intensities. Details of the experiments and the calculation method are reported and the applicability as homogeneity test and losses studies is discussed.