

Analytical Solution and Numerical Calculate of Type II Superconductor Strip with Current in a Perpendicular Magnetic Field

Dzung Nguyen Xuan ^a, Dojun Youm ^b

^a *Department of Physics, Hanoi University, Vietnam*

^b *Korea Electrotechnology Research Institute, Changwon, Korea*

Superconductivity was discovered by Kamerlingh Onnes in mercury at 4K in 1911. After that, people try to increase the T_c of superconductor. The highest T_c achieved in the YBCO, BSCCO, and TBCCO systems are 93K, 110K, and 130K, respectively. These results open the way to apply high T_c superconductor. The model of superconductor strip is studied since many years ago. The article of E. H. Brant show us the analytical solution of type II superconductor strip with current in a perpendicular magnetic field, with the critical current assumed that known. In this report we will show the way to have these analytical solutions of current density, magnetic field, penetrated magnetic flux and magnetic moment with the image method and conformal mapping. And by using Matlab, we can get the numerical solutions in some special case. These results are useful to compare with the experiment with high T_c thin film superconductor.

Keywords: current density, magnetic field