

***E*-*J* Characteristics in a Bi-2223 Silver-Sheathed Tape Wire in a wide Range of Electric Field**

T. Kodama¹⁾, M. Fukuda¹⁾, Y. Hayashi¹⁾, E. S. Otabe¹⁾, T. Matsushita^{1),2)}, K. Itoh³⁾

¹⁾Kyushu Institute of Technology, 680-4 Kawazu, Iizuka 820-8502, Japan

²⁾Kyushu University, 6-10-1 Hakozaki, Higashi-ku, Fukuoka 812-8581, Japan

³⁾National Research Institute for Metals, 1-2-1 Sengen, Tsukuba 305-0047, Japan

The electric field which high temperature superconductors experience is widely ranged depending on their application. Therefore, it is necessary to estimate the E - J characteristics in a wide range of the electric field. In this paper the E - J characteristics are measured using a four probe method and a relaxation method of dc magnetization in high and low ranges of the electric field, respectively, for a Bi-2223 silver-sheathed tape wire. It is found that the critical indices (z , ν) and the transition field (B_g) obtained from the scaling of E - J curves changed with the range of the electric field. This is incompatible with the prediction of the vortex glass-liquid transition theory. The obtained results systematically and approximately explained by a theoretical analysis based on the flux creep-flow model in which the distribution of flux pinning strength is taken into account.

Mr. Takeshi Kodama
c/o Prof. Matsushita
Department of Computer Science and Electronics
Kyushu Institute of Technology
680-4 Kawazu, Iizuka 820-8502, Japan

tel&fax: +81-948-29-7683

e-mail: kodama@aquarius10.cse.kyutech.ac.jp