Pinning Performance of $(Nd_{0.33}Eu_{0.2}Gd_{0.47})Ba_2Cu_3O_y$ Single Crystal

M. Jirsa[1], M. Rames[1], P. Das[2], M. R. Koblischka[2], T. Wolf3, U. Hartmann[2]

[1] Institute of Physics ASCR, Na Slovance 2, CZ-182 21 Prague 8, Czech Republic;
e-mail: jirsa@fzu.cz
[2] Institute of Experimental Physics, Saarland University, D-66041 Saarbrücken, Germany
[3] Forschungszentrum Karlsruhe, Institute of Solid State Physics, D-76021 Karlsruhe, Germany

Abstract - The critical current density J_c, the pinning force density $F(=BJ_c)$, and the relaxation rate Q weredetermined from magnetic hysteresis loops (MHL) measured from 65 K to 90 K on a twinned $(Nd_{0.33}Eu_{0.2}Gd_{0.47})Ba_2Cu_3O_y$ single crystal with a strip-like surface structure. The strong second peak observed on the MHL at 65 K continuously decreased with increasing temperature but persisted up to 84 K. None of the $J_c(B)$ and $F(B)$ dependences scaled, let alone in a narrow range of T. A strong effect of twin channeling was observed but no special pinning effect due to the strip-like surface structure was recognized.

Manuscript received November 29, 2007; accepted Dec.19, 2007. Reference No. ST13, Category 2. Paper submitted to Proceedings of EUCAS 2007; published in JPCS 98 (2008), paper # 012191