Pinning Performance of (Nd$_{0.33}$Eu$_{0.2}$Gd$_{0.47}$)Ba$_2$Cu$_3$O$_y$ Single Crystal

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Abstract - The critical current density $J_c$, the pinning force density $F(BJ_c)$, and the relaxation rate $Q$ were determined 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$_2$Cu$_3$O$_y$ 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.

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