Driven Vortex States and Relaxation in Single Crystal $YBa_2Cu_4O_8$ and $YBa_2Cu_3O_{7-\delta}$

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Abstract

The vortex response to various ac-drives has been studied in $YBa_2Cu_4O_8$ and $YBa_2Cu_3O_{7-\delta}$ crystals. Well within the vortex solid phase a re-entrant resistive state has been observed that is characterized by long relaxation times. Pulse current respnse and IV characteristics reveal athat in this state the driven vortex system relaxes in a way to increase the effective pinning force. A phenomenological model accounts for the observed features, in particular the clock-wise hysteresis of the IV-curves and the increase of the apparent critical current with applied current amplitude.