

Peak effect in Bi and Tl cuprates - a disorder driven phase transition in the FLL

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Abstract

Changes of the flux patterns in the region of the second peak on magnetization curves in single crystals of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ and $\text{Tl}_2\text{Ba}_2\text{CuO}_{6+\delta}$ are studied magneto-optically. It is shown that the second peak at $M(H)$ loops corresponds to appearance in the crystals of a new large J_c magnetic phase. This phase revealed due to an increased induction gradient nucleates near the sample edges at increasing field and occupies the whole sample by the motion of a front separating it from the low field low- J_c phase. The phenomenon is treated within a recent theory [Koshelev and Vinokur, Phys.Rev.B**57**,8026 (1998)] of the transition from the Bragg glass FLL phase to the disordered state mediated by random pinning.