Equilibrium and Fluctuation Magnetization of $Tl_2Ba_2CaCu_2O_{8+\delta}$ Single Crystals

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Temperature dependence of reversible magnetization of $Tl_2Ba_2CaCu_2O_{8+\delta}$ single crystals with $T_c \sim 105$ K has been measured with fields up to 2 T. We analyzed reversible magnetization in terms of Hao-Clem model and Bulaevskii, Ledvij and Kogan(BLK) model. At low temperature, we found anomalous temperature dependence of κ and H_{c2}, similar to the $Bi_2Sr_2CaCu_2O_{8+\delta}$ single crystals and explained this with nonlocal contribution to magnetization. The reversible magnetization shows pronounced thermal fluctuation effects from T_c down to 75 K. From BLK model, we calculated penetration depth and found that its temperature dependency deviated from that obtained using London and Hao-Clem model.

keywords : $Tl_2Ba_2CaCu_2O_{8+\delta}$ single crystal, Hao-Clem model, nonlocal effect, thermal fluctuation