

Enhancement of Bose-glass superconductivity in $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ thin films

Nakielski G, Rickertsen A, Steinborn T, Wiesner J, Wirth G, Jansen AGM, Kötzer J
PHYSICAL REVIEW LETTERS 76 (1996) 2567

Dynamic scaling analyses of the ac conductivity measured between 1 and 190 kOe before and after heavy ion irradiation parallel to the c axis reveal continuous phase transitions to superconducting glassy vortex states. A first unambiguous evidence for the predicted Bose-glass (BG) behavior being stable up to the matching field $H_\phi \approx 40$ kOe is presented. The critical exponents differ significantly from those obtained for $\mathbf{H} \perp c$ and those reported recently for twin-free crystals, suggesting that the inherent uncorrelated disorder in thin films reduces the vortex line wandering, and therefore enhances the BG transition.