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Effects of heavy ion irradiation on the thermodynamic and transport properties of YBCO[1] XU LUO, Argonne Natl Lab/Brown Univ, MAXIME LEROUX, VIVEK MISHRA, Argonne Natl Lab, XINSHENG LING, Brown Univ, ULRICH WELP, WAI-KWONG KWOK, Argonne Natl Lab — The effects of Au heavy ion irradiation (HII) on the transport and thermodynamic properties of untwined YBCO crystals irradiated to dose matching fields of B_Φ = 6 Tesla and 1 Tesla along the crystallographic c-axis were studied by angle resolved magnetoresistivtiy and high resolution AC specific heat measurements. Results from transport measurements confirm an enhancement in the ab-plane critical current for magnetic fields aligned along the columnar defects induced by HII. Surprisingly, specific heat measurements reveal a reduction in the thermodynamic upper critical field anisotropy of YBCO by about one half in the B_Φ =6T crystal. Moreover, for the B_Φ =1T crystal, we found the formation of an anomalous peak in the critical temperature near the direction of HII which may be associated with the Bose-glass transition.

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Xu Luo
Argonne Natl Lab

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