

Abstract Submitted
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Flux Pinning and Structural Inhomogeneity in Superconducting $\text{BaFe}_{1.8}\text{Co}_{0.2}\text{As}_2$ Single Crystals QIANG LI, JUAN ZHOU, Brookhaven National Lab, JIUFENG TU, City College of New York, YUHANG REN, Hunter College, CUNY, LINJUN LI, YONGKANG LUO, HANG CHEN, GUANGHAN CAO, ZHU'AN XU, Zhe Jiang University — We report coordinated studies of flux pinning behavior and structural inhomogeneity in $\text{BaFe}_{1.8}\text{Co}_{0.2}\text{As}_2$ single crystals with superconducting transition temperature at 24 K, in order to understand the flux pinning mechanism in the iron-based superconducting materials. Static and dynamic behavior of vortices are investigated by transport, bulk magnetization, and quantitative magneto-optical imaging techniques, while high resolution analytical TEM is used to investigate the structural inhomogeneity down to atomistic level. Frequent flux jump, and enhanced flux pinning at elevated magnetic field, corresponding to the “fish tail” in magnetization hysteresis, are often observed. We will discuss the relationship between the flux pinning behavior and detailed structural properties in this and other related superconducting materials.

Qiang Li
Brookhaven National Lab

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