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Magnetic imaging of vortices and inhomogeneity in Ba(Fe,Co)$_2$As$_2$ by magnetic force microscopy WEIDA WU, S. PARK, Rutgers Center for Emergent Materials and Dept. of Physics & Astronomy, Rutgers University, LINJUN LI, YONGKANG LI, HANG CHEN, GUANGHAN CAO, ZHU'AN XU, Department of Physics Zhejiang University, Hangzhou 310027 China
— Single crystals of $BaFe_{2-x}Co_xAs_2$ synthesized by FeAs flux method were studied by variable temperature magnetic force microscopy (VT-MFM). The nominal Co doping concentrations range from underdoped region (x$\sim$0.1) to optimum doped region (x$\sim$0.2) of the superconducting dome. Sharp superconducting transitions ($\sim$1K) indicate good sample quality. Individual Abrikosov vortices were visualized by VT-MFM below Tc at low magnetic field. The temperature dependence of vortex configuration indicates a strong pinning effect, which is supported by Bean-model behavior[1] observed at high magnetic field. Results of magnetic inhomogeneity of underdoped samples will be discussed.

[1]C.P. Bean, PRL, 8, 250 (1962).

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