

Abstract Submitted
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Vortex dynamics in the $\text{YBa}_2\text{Cu}_3\text{O}_{7-d}$ Superconductor with In-plane Columnar Defects Introduced by Irradiation ANDRA PETREAN, Department of Physics, Austin College, LISA PAULIUS, Department of Physics, Western Michigan University, VALENTINA TOBOS, Department of Natural Sciences, Lawrence Technological University, HEATHER CRONK, Department of Physics, Austin College, WAI-KWONG KWOK, Materials Science Division, Argonne National Laboratory — We report on the effects of introducing columnar defects by irradiation in clean single crystals of $\text{YBa}_2\text{Cu}_3\text{O}_{7-d}$ in a direction *parallel* to the ab-plane. The defects were introduced by bombarding the samples with $^{208}\text{Pb}^{56+}$ ions at an energy of 1.4GeV. We find that the defects suppress the first order melting transition for magnetic fields aligned parallel or at small angles relative to the defects. The columnar defects *inhibit* vortex motion of vortices parallel to the defects, while the vortices experience less pinning when they are perpendicular to the defects. Our results suggest that the pinning anisotropy is increased, at least for magnetic fields up to the matching field dose of 1T.

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