

Abstract Submitted
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Highly effective superconducting vortex pinning in conformal crystals¹ S. GUÉNON, Department of Physics and Center for Advanced Nanoscience, University of California San Diego, Y.J. ROSEN, Department of Physics, University of Maryland and Laboratory for Physical Sciences, College Park, MD, ALI C. BASARAN, IVAN K. SCHULLER, Department of Physics and Center for Advanced Nanoscience, University of California San Diego — In the last few years, the search for an artificial pinning center (APC) distribution that pins a vortex lattice in a superconducting thin film over a wide magnetic field range has attracted a lot of attention. Recently, a conformal crystal obtained by conformally mapping a hexagonal lattice was proposed [1]. We compared the magneto-transport measurements of a conformal crystal and a randomly diluted APC distribution with a triangular reference lattice. We discovered for both APC distributions that the magneto-resistance is significantly reduced in a magnetic field interval between the first matching fields of the triangular reference lattice. Moreover, in this interval, the magneto-resistance of the conformal crystal APC distribution is below the noise floor indicating highly effective vortex pinning over a wide magnetic field range.

[1] D. Ray et al., Phys. Rev. Lett. 110, 267001 (2013)

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