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Small-angle neutron scattering study of vortex matter in superconducting $Ba(Fe_{0.93}Co_{0.07})_2As_2$[1] M. R. ESKILDSEN, University of Notre Dame, T. BLASIUS, University of Michigan, A. I. GOLDMAN, Ames Laboratory and Iowa State University, J. M. DENSMORE, University of Notre Dame, C. D. DEWHURST, Institut Laue-Langevin, N. NI, A. KREYSSIG, S. L. BUD'KO, P. C. CANFIELD, Ames Laboratory and Iowa State University — We present small-angle neutron scattering studies of the superconducting vortices $Ba(Fe_{0.93}Co_{0.07})_2As_2$. At all fields measured a ring of scattering was observed, indicating a highly disordered vortex configuration, and no discernable rocking curve could be measured. The field dependence of the magnitude of the scattering vector indicates vortex lattice domains of (distorted) hexagonal symmetry. An analysis of the scattered intensity due to the vortices shows a rapid decrease with increasing applied magnetic field, significantly exceeding what would be expected based on estimates of the upper critical field. These results are consistent with the existence of a vortex glass or Bragg glass phase in $Ba(Fe_{0.93}Co_{0.07})_2As_2$.

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Morten Ring Eskildsen
University of Notre Dame

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