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Density oscillation of flux lines induced by a single twin plane with point pins YOSHIHIKO NONOMURA, XIAO HU, Computational Materials Science Center, National Institute for Materials Science, Tsukuba, Ibaraki 305-0047, Japan, DAVID R. NELSON, Lyman Laboratory of Physics, Harvard University, Cambridge, MA 02138 — In (1+1)-dimensional vortex matter with a single columnar defect [1], the density of flux lines parallel to a single columnar defect shows Friedel-like oscillations in a tilted field, with the correlation length of the amplitude of the oscillation diverging as the transverse field component vanishes. In this study, we show that similar behaviors are also observed in vortex states in three dimensions with a single twin plane and point pins. In a magnetic field along a twin plane at low enough temperatures, power-law decay of the density oscillation of flux lines is observed for sparse point pins, consistent with the existence of a Bragg glass phase. As the density of point pins increases, it changes to exponential decay in the strongly- pinned vortex glass regime. A similar density oscillation is observed in a slightly tilted field, and the range of the oscillation is enhanced in the limit of sparse point pins. [1] W. Hofstetter et al., Europhys. Lett. 66 (2004) 178; I. Affleck et al., J. Stat. Mech.: Theor. Exp. (2004) P10003.

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