

Abstract Submitted
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Molecular dynamic simulation on the role of the defect size on critical current at low temperature¹ ABDALLA OBEIDAT, HADEEL ABU-LAHIM, Jordan University of Science and Technology — Molecular dynamics have been used to study the effect of the pinning center sizes on the critical current density of driven vortex lattices interacting with periodic arrays of pinning sites in two dimensions. In our study, we assumed that the radii of the pinning centers are much larger than the coherence length of the vortices. The critical current density has been studied at different temperatures for several values of pinning strengths. The overdamped equation of vortex motion has been solved taking into account the vortex-vortex repulsion, the thermal force, the attractive vortex-pinning interaction, and the driving Lorentz force. We found that the critical current density is independent of pinning size at low temperatures.

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