

Abstract Submitted
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Spatial correlations, spin-orbit coupling, and ferromagnetism in Ga(Mn)As K. MIKELSONS, University of Cincinnati, Oak Ridge National Lab, B. MORITZ, University of North Dakota, University of Cincinnati, S. KANCHARLA, Oak Ridge National Lab, J. MORENO, University of North Dakota, R.S. FISHMAN, Oak Ridge National Lab, M. JARRELL, University of Cincinnati — The self-consistent Dynamical Cluster Approximation (DCA) is used to study the effect of strong spin-orbit coupling in models of GaMnAs. Both heavy and light carrier bands, degenerate at the Γ -point, are included using the spherical approximation. Local dynamics as well as short-range spatial correlations are studied using the DCA, adapted for impurity systems in the dilute limit. The critical temperature for ferromagnetism is obtained for different arrangements of magnetic impurities and a range of coupling strengths and carrier concentrations. These calculations clearly demonstrate the suppression of the ferromagnetic transition temperature when one accounts for spatial correlations between impurities and the reduction in saturation magnetization due to the strong spin-orbit coupling.

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