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Ferromagnetic transition temperature of a two-band model for diluted magnetic semiconductors FLORENTIN POPESCU, FSU, UTK, YUCEL YILDIRIM, FSU, UTK, ORNL, GONZALO ALVAREZ, ORNL, CENGIZ SEN, FSU, NHMFL, ADRIANA MOREO, ELBIO DAGOTTO, UTK, ORNL — Within dynamical-mean field theory we investigate the ferromagnetic transition temperature (T_c) of a two-band model for diluted magnetic semiconductors in a large range of coupling constants, hopping parameters, and carrier densities [1]. We reveal that T_c is optimized at all fillings when both impurity bands fully overlap in the same energy interval, namely when the exchange couplings and bandwidths are equal. The optimal T_c is found to be about twice larger than the maximal value obtained in the one-band model. Within a one-band model we also discuss the influence of the Coulomb attractive potential by acceptors on the critical ferromagnetic temperature [2].

[1]. F. Popescu, Y. Yildirim, G. Alvarez, A. Moreo, and E. Dagotto, Phys. Rev. B, 73 (2006), 075206.
[2]. F. Popescu, C. Sen, E. Dagotto, and A. Moreo, in preparation.

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