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**Ferromagnetism of  $\text{Ga}_{1-x}\text{Mn}_x\text{As}$  and Weiss theory of Curie temperature in the coherent potential approximation<sup>1</sup>** SZE-SHIANG FENG, MOGUS MOCHENA, Florida A&M University — Using spin- $\frac{1}{2}$  description of valence holes and Kondo coupling between local spins and carriers, the zinc-blende GaAs-based III-V diluted magnetic semiconductors (DMS) are studied in the coherent potential approximation (CPA). We use the exact Hilbert transformation of the face-centered cubic (fcc) density of states (DOS). Our calculated relation of ground-state energy and impurity magnetization shows that ferromagnetism is always favorable at low temperatures. For very weak Kondo coupling, the density of states (DOS) of the host semiconductor is modified slightly. Impurity band can be generated at the host band bottom only when Kondo coupling is strong enough. Using Weiss molecular theory, we predict a nonlinear relation of Curie temperature with respect to Kondo coupling. Our calculated  $T_C$  agrees with measured values very well.

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