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**A ring graph method for approximating atomic short-range order in disordered multi-component systems** ZHUN-YONG ONG, University of Illinois at Urbana-Champaign — The atomic short-range order (ASRO) in an alloy provides valuable information on the atomic structure to which the disordered alloy is tending. Mean field models with Onsager corrections have been used to calculate the ASRO in lattice models of disordered multi-component alloys. The Onsager correction is composition and temperature dependent and corrects for the over-correlation inherent to mean-field methods so that ASRO calculated satisfies the sum rule. However, it is does not take into account the k-dependence of the corrections. We present an analytical method based on ring graphs which provides for a k-dependent correction to the mean field. The ASRO in a simple ternary Ising model in a FCC lattice with nearest neighbor interactions is calculated using our method and compared to the results obtained from a Monte Carlo simulation. We find that, above the transition temperature, the analytical results are in good agreement with those obtained from simulations.

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