Critical temperature of ferromagnetic layered Ising models

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A layered Ising model has interactions which are invariant under translations of a sublattice $\mathbb{Z}\times n\mathbb{Z}$ of $\mathbb{Z}^2$. For the ferromagnetic model, we prove an exact, quantitative characterization of the critical temperature, defined as the supremum of temperatures for which the spontaneous magnetization is strictly positive. The critical temperature is the solution of a certain algebraic equation, resulting from the condition that the spectral curve of the corresponding dimer model on the Fisher graph has a real zero on the unit torus.