The Curie Temperature of the Ferroelectric Superlattice Films with Surface Modification

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We examine the critical behaviour of a finite alternating ferroelectric superlattice based on the transverse Ising model within the framework of the mean-field approximation. The results indicate that the features of the phase diagrams can be greatly modified by changing the transverse Ising model parameters. The transition temperature of alternating superlattice is described as function of the inter- and intra-layer exchange interactions, the strength of the transverse field, the superlattice thickness and the polarizations. In addition, the effects of surface modification on finite superlattices are also studied.