

Solvation forces in 2D Ising stripes

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The solvation forces for the 2D Ising stripes are calculated via exact diagonalization of the transfer matrix in two cases: the symmetrical case corresponds to identical boundary fields, and the antisymmetrical case to exactly opposite boundary fields. In the symmetric case the solvation force is always negative (attractive) while in the antisymmetric case the solvation force is positive (repulsive) at high temperatures and negative at low temperatures. It has a maximum close to the bulk critical temperature, changes sign close to the temperature of the wetting transition taking place in the semi-infinite system. The properties of the solvation forces are presented via the scaling functions describing their dependence on temperature, surface field, and stripe's width.