Title:	Confinement-deconfinement transition and Z2 symmetry in Z2+Higgs theory
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Abstract:	In this paper, we study the Polyakov loop and the Z2 symmetry in the lattice Z2+Higgs theory in four-dimensional space using Monte Carlo simulations. The results show that this symmetry is realized in the Higgs symmetric phase for large number of “temporal” lattice sites. To understand this dependence on the number of “temporal" sites, we consider a one-dimensional model by keeping terms of the original action corresponding to a single spatial site. In this approximation, the partition function can be calculated exactly as a function of the Polyakov loop. The resulting free energy is found to have the Z2 symmetry in the limit of large temporal sites. We argue that this is due to Z2 invariance as well as dominance of the distribution or density of states corresponding to the action.
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