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Title:	ZN symmetry in SU(N) gauge theories
Authors:	Biswal, Minati (/jspui/browse?type=author&value=Biswal%2C+Minati) Digal, Sanatan (/jspui/browse?type=author&value=Digal%2C+Sanatan) Mamale, Vinod (/jspui/browse?type=author&value=Mamale%2C+Vinod) Shaikh, Sabiar (/jspui/browse?type=author&value=Shaikh%2C+Sabiar)
Keywords:	Phase transition gauge theories confinement
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Abstract:	In this paper, we study ZN symmetry of SU(N) gauge group, in one-dimensional gauged chain. The action can be obtained by considering the terms of a (3+1)-dimensional Euclidean lattice action of a SU(N) gauge theory that break the ZN symmetry explicitly. The matter fields in the resulting partition function can be integrated out exactly, for a given background of link variables, to calculate the Polyakov loop free energy. To keep the temperature fixed, the lattice spacing is scaled appropriately as the number of "temporal" sites is varied. In the case of Higgs as matter field, the Polyakov loop free energy exhibits the ZN symmetry in the limit of large number of temporal sites. For fermions, the strength of ZN explicit breaking decreases for finer lattices, but approaches a nonzero value in the same limit. We discuss the possible implications of these results to SU(N) gauge theories in 3+1 dimensions.
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