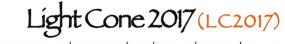Light Cone 2017 (LC2017)

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Z_N symmetry and Confinement-Deconfinement transition in SU(N)+Higgs theory.

We study Z_N symmetry in $SU(N)$+Higgs theories. The Z_N symmetry can act only
on the gauge fields, the action is not invariant. This leads to explicit breaking of Z_N symmetry. However, we
find that the strength of the explicit breaking depends on the parameters of the theory, vanishing in parts of
the symmetric phase. According to conventional expectations the symmetry is restored only in the pure gauge
limit. We argue that the symmetry restoration is due to enhancement of the phase space in the continuum
limit i.e. when the temporal lattice sites are larger.

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