

Topology and Center Symmetry in Yang-Mills theories

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In this work we investigate the relation between the realization of center symmetry and the theta-dependence of SU(3) and SU(4) Yang-Mills theories defined on $R^3 \times S^1$. In particular we use the double-traced deformed version of Yang-Mills theory, in which extra pieces coupled to the traces of the powers of Polyakov loop are added to the standard action in order to recover center symmetry even at small compactification radii. First we study the phase diagram in the deformation plane; then we compute the topological susceptibility and the first term of the theta expansion of the free energy in the deformed theory and we compare them with the known values of the undeformed one.

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