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Local gauge invariance and dynamics of a non-equilibrium system close to critical region of phase transition

Monday 12 December 2022 14:00 (1 hour)

In this work we calculate the time evolution of local gauge invariant field theoretical model, comprising of a scalar field coupled to vector gauge field. Assuming a linear relationship between phase angles $\alpha(x)$ at two closely separated space-time points x and $x' = x - \delta$, with $0 < \delta < 1$, we obtain an explicit dependence of scalar field $\varphi(x)$ at x and x' in terms of Wilson-line variable. Using the modified value of field $\varphi(x')$ we evaluate the effective coupling of this system in dimension $d < 4$ near the critical region. In the mean-field approximation, we found that the scalar self coupling λ at Wilson-Fisher fixed point of this system is modified as $\lambda_* = \lambda W F / t4$, where $\lambda W F = 16\pi 2$
3 (d − 4) and t is the time of evolution.
With this modified coupling we found that the density of active states for this system behave as $\Omega \propto 1$ t4 .

Session

Heavy Ions and QCD

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