

Third-Order Approximation of 0^{++} Glueball Mass and Wavefunction of (2+1)-Dimensional SU(3) Lattice Gauge Theory

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Abstract: The random phase approximation is applied to the coupled-cluster expansions of lattice gauge theory (LGT). Using this method, wavefunctions are approximated by linear combination of graphs consisting of only one connected Wilson loop. We study the excited state energy and wavefunction in (2+1)-D SU(3) LGT up to the third order. The glueball mass shows a good scaling behavior.

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Key words: random phase approximation, coupled-cluster expansion, Wilson loop, glueball mass

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