

Abstract Submitted
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Schwinger boson spin liquid states on square lattice: projective symmetry group study XU YANG, FA WANG, Peking Univ — We will report our results on possible spin liquids on square lattice that respect all lattice symmetries and time-reversal symmetry within the framework of Schwinger boson (mean-field) theory. Such spin liquids have spin gap and emergent Z_2 gauge field excitations. We classify them by the projective symmetry group method, and find six spin liquid states that are potentially relevant to the J_1 - J_2 Heisenberg model. The properties of these states are studied under mean-field approximation and by projected wave functions on small lattices. Interestingly we find a spin liquid state that can go through continuous phase transitions to either Néel magnetic order or magnetic order of wavevector at Brillouin zone edge center. We propose that this state may be realized in J_1 - J_2 Heisenberg model with ring exchange.

Fa Wang
Peking Univ

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