

Quantum vorticity at positive temperature for spin systems with continuous symmetry

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We propose a definition of vorticity at inverse temperature β for Gibbs states in quantum XY or Heisenberg spin models on a lattice, by testing $\exp[-\beta H]$ on a complete set of observables (“one-point functions”). We show in particular that it is independent of the choice of a particular basis. Imposing a compression of Pauli matrices at the boudary, which stands for the classical environment, we make some numerical simulations on finite lattices, and exhibit usual vortex patterns.