Phase diagram analysis of the fully frustrated XY model within a twisted conformal field theory approach

Giuliano Niccoli

Université de Cergy-Pontoise, France

In this contribution we extend earlier results by Foda [1]
and show how the U(1)G@ Z2 symmetry of the Fully Frustrated XY (FFXY) model on a square lattice can be accounted for in the framework of the m-reduction procedure developed for a Quantum Hall system at paired states fillings G@=1 [2].
The resulting twisted conformal field theory (CFT) with central charge c=2 is shown to well describe the physical properties of the FFXY model. The whole phase diagram is recovered by perturbing the TM model (c = 2) with relevant operators and by analyzing the corresponding RG flow. An unbinding phenomenon of kink-antikink states takes place which in turn gives rise to a massless line flow from the Z2 degenerate vacuum of the TM to the infrared fixed point of the Moore-Read model (c = 3/2). In this way the Z2 non-invariant degrees of freedom of the TM decouple and the partition function gets reduced to the Moore-Read one with the consequent loss of the ground state degeneracy [3].