Universality class of S=1/2 quantum spin ladder systems with four-spin exchange

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S=1/2 quantum-spin two-leg ladder systems have been studied in relation with high temperature superconductivity and Haldane's conjecture. However, there are relatively few numerical studies on universality class of phase transitions. One of the difficult points is that often these phase transitions belong to infinite dimensional type, therefore there appear logarithmic corrections.

We have studied S=1/2 two-leg ladder XXZ spin model with two body interaction terms in ref. [1].

Next, with four-spin exchange terms, we have studied universality class of S=1/2 spin ladder in refs. [1] and ref [2]. We have found that the phase transition belongs to the central charge c=3/2 type in conformal field theory (CFT) language, after eliminating logarithmic corrections.

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