

2D SU(2) PRINCIPAL CHIRAL MODEL: DUAL
REPRESENTATION IN THE CLASSICAL
LIMIT AND LOW-TEMPERATURE
ASYMPTOTICS OF CORRELATION
FUNCTIONS

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S u m m a r y

We develop an analytical approach to the investigation of the low-temperature limit of the two-dimensional (2D) lattice SU(2) principal chiral model. The basic idea is to formulate the model on a dual lattice. A dual representation is derived in the classical limit, i.e. in the region of large angular momenta. The derivation involves one approximation which is a certain asymptotic relation between the $6j$ symbols and the Clebsch—Gordan coefficients. The leading terms of two-point and link-link correlation functions are evaluated in the dual formulation, and it is shown that both correlations have power-like decay. This claim is a result of the second approximation which consists in substituting the SU(2) generalized characters by their asymptotics which hold uniformly in the vicinity of the identity element of the SU(2) link matrix. Moreover, if certain local defects are bound into multipoles and cannot produce a mass gap, the low-temperature region seems to be completely dominated by the spin-wave contribution.