Phase diagram of frustrated ladder and 2D antiferromagnets[1]

ALEXANDROS METAVITSIADIS, DANIEL SELLMANN, SEBASTIAN EGGERT, University of Kaiserslautern
— We investigate the low energy properties of the frustrated two leg diagonal ladder exhibiting both intra- and inter-chain frustration. The renormalization group is used to obtain the phase diagram while varying the microscopic lattice parameters. We particularly emphasize the role of the in-chain marginal operators, which is tuned by the in-chain frustration and can promote a dimer phase in the system. Finally, the physics of the quasi one dimensional diagonal ladder is incorporated into a two dimensional square lattice since the former is used as the primary structure to build up the square lattice. Within the validity of our method, the classical phases—a Néel antiferromagnet and a collinear antiferromagnet—are predicted. The results are compared to numerical DMRG calculations.

Sebastian Eggert
University of Kaiserslautern

Electronic form version 1.4